New Academic Program Workflow Form

General

Proposed Name: Ecosystem Genomics GIDP

Transaction Nbr: 00000000000098

Plan Type: Minor

Academic Career: Graduate

Degree Offered:

Do you want to offer a minor? Y

Anticipated 1st Admission Term: Fall 2021

Details

Department(s):

AGSC

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<td>1232</td>
<td>Agricultural Education</td>
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<td>School of Plant Science</td>
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<td>1239</td>
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GRDC

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SBSC

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<tr>
<td>3008</td>
<td>School of Geography and Development</td>
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SCNC

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<tr>
<td>0469</td>
<td>Hydrology and Atmospheric Sciences</td>
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Campus(es):

**MAIN**

<table>
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<tr>
<th>LOCATION</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TUCSON</td>
<td>Tucson</td>
</tr>
</tbody>
</table>

Admission application terms for this plan: Spring: N Summer: N Fall: Y

Plan admission types:
Freshman: N   Transfer: N   Readmit: N   Graduate: Y
Non Degree Certificate (UCRT only): Y
Other (For Community Campus specifics): N


- Program Length Type: Program Length Value: 0.00
- Report as NSC Program:
- SULA Special Program:

Print Option:

- Diploma: Y   Ecosystem Genomics Graduate Interdisciplinary Program
  - PhD Minor
- Transcript: Y   Ecosystem Genomics Graduate Interdisciplinary Program
  - PhD Minor

Conditions for Admission/Declaration for this Major:
We welcome active doctoral students who are enrolled full time at the University of Arizona, with background and training in ecology, evolutionary biology, entomology, plant sciences, biosystems engineering, hydrology, atmospheric science, environmental science, and/or natural resource management. While students from diverse programs will be considered, we anticipate that students generally will be enrolled in a graduate program aligned conceptually with ecosystem genomics (e.g., but not limited to, Ecology and Evolutionary Biology (EEB), Entomology and Insect Sciences (EIS), School of Plant Sciences (SPLS), Biosystems Engineering (BE), Hydrology and Atmospheric Sciences (HAS), Environmental Sciences (ENVS), School of Natural Resources and the Environment (SNRE), School of Information (INFO), and School of Geography, Development, and Environment (GEOG). Students who previously completed the Graduate Certificate in Ecosystem Genomics are not eligible to earn the minor.
**Requirements for Accreditation:**

We will not seek accreditation.

**Program Comparisons**

**University Appropriateness**

The proposed Ecosystem Genomics GIDP fits under two pillars of the University of Arizona's strategic plan: Grand Challenges 2.2A--Preeminence in environmental research and education, by striving to "excel in research on the natural and built environment..."; and Arizona Advantage 3.1A--Strengthen commitment to equity and support of diverse communities by "creat[ing] engaging and empowered campus environments that inspire creativity, enhance our ability to think critically, and challenge us to approach some of society's most complex problems without hesitation, and enriched by diverse perspectives... leading the way toward a society that taps into the talents, wisdom, and strengths that all individuals and communities possess to solve our greatest problems."

The GIDP Co-Chairs, participating faculty, and University leaders such as Dean Carnie and Dr. Folks have a shared commitment to fostering the long-term sustainability and growth of ecosystem genomics as an emerging critical science at University of Arizona, with attention to continued recruitment of faculty; supporting research, teaching, curriculum development, outreach, and mentorship through the ecosystem genomics initiative; and enhancing and formalizing graduate student training through the proposed GIDP.

The University of Arizona is the most appropriate location within the Arizona University System for this GIDP because of our sustained and growing excellence in Ecosystem Genomics, as reflected in our Ecosystem Genomics Initiative, the highly successful Ecosystem Genomics cluster hire, and the thriving focus on ecosystem genomics that connects multiple colleges and units on campus in a new, emergent, convergent science. Moreover, the University of Arizona, as Arizona's land-grant institution, is uniquely positioned to serve stakeholders statewide and regionally with problem-solving that, by working across scales from genomics to ecosystems, can solve grant challenges in human sustainability. Finally, as a Hispanic Serving Institution the University of Arizona has the opportunity to increase the recruitment, inclusion, retention, and visibility of diverse students in graduate programs in STEM. This GIDP aims to enhance graduate recruitment to partner programs with an infusion of support from the National Science Foundation Research Trainee grant (BRIDGES), which supports the initiation and first strategic phase of this GIDP.

**Arizona University System**

<table>
<thead>
<tr>
<th>NBR</th>
<th>PROGRAM</th>
<th>DEGREE</th>
<th>#STDNTS</th>
<th>LOCATION</th>
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<tr>
<td>1</td>
<td>Ecol. &amp; Environ. Informatics</td>
<td>PHD</td>
<td>11</td>
<td>NAU (Main-Flagstaff Mountain)</td>
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Peer Comparison

The proposed program is globally unique and complements existing programs in the integrative life sciences by centering on a newly emergent and convergent scientific field, the interdisciplinary science of ecosystem genomics. While many programs exist with major/minor emphases in genomics, ecosystem science, and related disciplines, we did not identify any existing minor (or major) program that focuses on integrating from genes to ecosystems in a manner that reaches from molecules to landscapes, from soils to the atmosphere, from microbes to plants and insects, and from wild lands to agriculture. The closest matches are presented in the comparison table: the T3 option in the INF (Informatics) PhD program at Northern Arizona University; and the Environmental Life Sciences PhD at Arizona State University. Both are oriented toward sustainability and addressing grand challenges in sustainability, the former through informatics and the latter through traditional environmental science. Both are outstanding and successful programs that differ from, and are complementary to, the proposed UArizona GIDP PhD Minor in Ecosystem Genomics: the proposed GIDP brings students in diverse areas together on a convergent training program in an emergent field of ecosystem genomics, rather than drawing only from informatics students or only from students studying environmental science: our partner programs on campus include EEB, BE, EIS, SNRE, HAS, SPLS, ENVS, GEOG, and INFO. The proposed GIDP has a novel core course that spans the emergent discipline and is distinct in its dual foci in ecosystem sciences and genomics. The role of informatics for the proposed GIDP is to advance the synthesis of ecosystem sciences and genomic sciences, advancing the emergent discipline as a tool rather than a focus. Coupled with our outstanding faculty hires in Ecosystem Genomics, our active faculty research programs, and our initial funding through the National Science Foundation, the GIDP in Ecosystem Genomics is conceptualized as a novel and innovative program that will fill an open niche at the leading edge of interdisciplinary science.

Faculty & Resources

Faculty

Current Faculty:

<table>
<thead>
<tr>
<th>INSTR ID</th>
<th>NAME</th>
<th>DEPT</th>
<th>RANK</th>
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<tr>
<td>01868877</td>
<td>Luciano Matzkin</td>
<td>1235</td>
<td>Assoc. Prof</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>01875717</td>
<td>Jana Uren</td>
<td>1230</td>
<td>Assit. Prof</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>02565087</td>
<td>Bonnie Hurwitz</td>
<td>1230</td>
<td>Assoc. Prof</td>
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<tr>
<td>06902489</td>
<td>Andrew Comrie</td>
<td>3008</td>
<td>Professor</td>
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<tr>
<td>08609517</td>
<td>Jennifer Croissant</td>
<td>0433</td>
<td>Assoc. Prof</td>
<td>Doctor of Philosophy</td>
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<tr>
<td>11403676</td>
<td>Anne Arnold</td>
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<td>Professor</td>
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<td>13205326</td>
<td>Rod Wing</td>
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<tr>
<td>13509167</td>
<td>Erin Leahey</td>
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<td>14903023</td>
<td>Scott Saleska</td>
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<tr>
<td>22052456</td>
<td>Katrina Dlugosch</td>
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<tr>
<td>22052954</td>
<td>Rachel Gallery</td>
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<td>22067228</td>
<td>Laura Meredith</td>
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<td>22074294</td>
<td>Albert Barberan</td>
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<td>22085060</td>
<td>Winslow Burleson</td>
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<tr>
<td>22086244</td>
<td>Yang Song</td>
<td>0469</td>
<td>Assit. Prof</td>
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Additional Faculty:
No additional faculty needed.

Current Student & Faculty FTE

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Projected Student & Faculty FTE

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Library

Acquisitions Needed:
None.

Physical Facilities & Equipment

Existing Physical Facilities:
The GIDP will use existing physical facilities already in use by our partner.
graduate programs. Dr. Jennifer Barton, Director of The BIO5 Institute has agreed to provide office space for the Program Coordinator. No special facilities are required.

Additional Facilities Required & Anticipated:
None.

**Other Support**

Other Support Currently Available:

Directors/Coordinators/Chairs of Graduate Studies in partner programs have agreed to assist in student recruitment to the GIDP minor. Funds from the National Science Foundation, College of Science, and College of Agriculture and Life Sciences will support the Program Coordinator for the first five years of the GIDP, with plans currently underway to seek private, donor, and institutional support thereafter. Funding for personnel for the GIDP will be non-Graduate College/GIDP resources.

The BIO5 Institute will provide support the Ecosystem Genomics Seminar Series to bring 2-3 domestic and international speakers per year to UA for the first five years of the GIDP. The Co-Chairs of the GIDP are tenured faculty members contributing their leadership as service aligned with the University of Arizona's strategic aims.

Other Support Needed over the Next Three Years:
None.

**Comments During Approval Process**

12/2/2021 2:21 PM
BCOLOMBI

<table>
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<tr>
<th>Comments</th>
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<tbody>
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NEW ACADEMIC PROGRAM- STANDALONE GRADUATE MINOR ADDITIONAL INFORMATION FORM

I. MINOR DESCRIPTION - provide a marketing/promotional description for the proposed minor. Include the purpose, nature, and highlights of the curriculum, faculty expertise, etc. The description should match departmental and college websites, handouts, promotional materials, etc.

The Ecosystem Genomics Graduate Interdisciplinary Program (GIDP) PhD Minor will support and train diverse, outstanding doctoral students in ecosystem genomics, an emergent discipline that integrates across biotic systems from genes to ecosystems to solve grand challenges in sustainability and innovation in a rapidly changing world. As an innovative, interdisciplinary area of study, ecosystem genomics represents the synthesis of ecosystem- and genomic sciences via the tools of computational biology, modeling, data science, experiments, theory, applications, and the approaches and power of ‘big data’ in a collaborative and convergent framework.

The ultimate aim of the Ecosystem Genomics GIDP is to foster a new generation of diverse transdisciplinary scientists to address the challenges of sustaining natural and managed ecosystems on which humans depend, including wildlands, agricultural systems, forests, arid lands, and marine environments. The coursework supported by this minor will help students think across scales from ‘genes to ecosystems’ as they develop skills in interdisciplinarity, scientific communication, and collaboration. At its core the minor will foster and extend students’ excellence in areas such as data science, microbiology, plant sciences, insect science, environmental science, atmospheric science, biosystems engineering, ecology and evolutionary biology, geography and information science, and it is intended to attract students majoring in these UArizona programs. Ultimately the minor will help students translate ideas into meaningful scientific advances while cultivating deep and broad skill sets and promises to prepare students for important roles in solving grand challenges relevant to regional, national, and international issues in sustainability and innovation.

II. NEED FOR THE MINOR/JUSTIFICATION - provide market analysis data or other tangible evidence of the need for and interest in the proposed minor. This might include results from surveys of current students, alumni, and/or employers or reference to student enrollments in similar programs in the state or region. Curricular Affairs can provide a job posting/demand report by skills obtained/outcomes of the proposed minor. Please contact the Office of Curricular Affairs to request the report for your proposal.

Ecosystem genomics is both a new scientific discipline and a nexus for coalescing UArizona’s existing and emergent strengths in environmental science, microbial ecology, plant science, insect science, hydrology and atmospheric science, biosystems engineering, natural resources, ecology, evolutionary biology, genome-enabled science, and “big data” cyberinfrastructure to address the grand challenge of scaling biological information from genes to ecosystems. This GIDP is motivated by a group of faculty with shared and resonant interests who already have come together as collaborators, co-mentors, and instructors to fill a clear need in the job market, from industry to academia to government and non-governmental organizations. As evidenced by our letters of support from industry, as but one example of the excitement among prospective employers, there is considerable enthusiasm for the program.

This minor will simultaneously advance theory and practical solutions to problems ranging from global climate change to human health. As a science, ecosystem genomics integrates the theory and tools of ecosystem ecology with meta-omics approaches to open a new window on mechanisms that regulate scaling of micro- to macro-scale processes in natural and human-built environments. This minor seeks to advance predictive understandings of how biological information networks regulate natural and human ecosystem responses to change.
The University of Arizona already has supported the development of the Ecosystem Genomics focus area through a faculty cluster hire that resulted in 6 new faculty at the Assistant/Associate Professor level in 5 departments. The foundation for the cluster hire in Ecosystem Genomics emerged from the iBiosphere Working Group that was convened in 2012 at the request of then-Associate VPR Andrew Comrie, and Deans Shane Burgess (CALS) and Joaquin Ruiz (COS). In creating the iBiosphere concept, a group of nine faculty members from six colleges developed a strategic plan for enhancing interfaces among the natural sciences, information sciences and social sciences, with a primary nexus being 'big-data' and 'big-computing'. 

Since then, the team of faculty has grown to 15 faculty in nine units. This effort resulted in a successful 5-year NSF Research Training (NRT) grant in Ecosystem Genomics that started in Fall 2020. During the first recruitment cycle more than 45 incoming students applied, suggesting interest and sustainability for a long-term program in this area. Moreover, employers such as Bayer Crop Sciences and Indigo Agriculture have expressed their support for graduate training in Ecosystem Genomics, indicating opportunities for future jobs for students from our program. We anticipate that the training provided by the minor will expand and complement the expertise gained by doctoral students in majors in partner programs (EEB, EIS, BE, SPLS, ENVS, HAS, SNRE, GEOG, INFO) and foster additional hard- and soft-skill training that will propel them as they move on to careers in academia, governmental agencies, non-profits, industry, agriculture, data science, and more.

III. MINOR REQUIREMENTS - complete the table below to list the minor requirements, including minimum number of credit hours, required core, electives, and any special requirements. Note: information in this section must be consistent throughout the proposal documents (comparison charts, curricular/assessment map, etc.).

| Total transfer units that may apply to minor | Three (3), but these may not replace the Ecosystem Genomics Seminar |
| Pre-admissions expectations (i.e., academic training to be completed prior to admission) | We welcome active doctoral students who are enrolled full time at the University of Arizona, with background and training in ecology, evolutionary biology, entomology, plant sciences, biosystems engineering, hydrology, atmospheric science, environmental science, and/or natural resource management. While students from diverse programs will be considered, we anticipate that students generally will be enrolled in a graduate program aligned conceptually with ecosystem genomics (e.g., but not limited to, Ecology and Evolutionary Biology (EEB), Entomology and Insect Sciences (EIS), School of Plant Sciences (SPLS), Biosystems Engineering (BE), Hydrology and Atmospheric Sciences (HAS), Environmental Sciences (ENVS), School of Natural Resources and the Environment (SNRE), School of Information (INFO), and School of Geography, Development, and Environment (GEOG)). 

To apply, an interested student should contact the Program Coordinator or co-chairs. There are no additional GPA requirements beyond a 3.0. |

| Minor requirements. List all minor requirements including core and electives. Courses listed must include course prefix, number, units, and title. Mark new coursework (New). Include any limits/restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for courses not owned by your department. | All courses already exist and are taught regularly in person on the UArizona main campus. We have reached out to instructors and unit/department heads to confirm that the GIDP minor would not create enrollment challenges. Letters of support are included. 

11 units required (3 core + 8 or more elective units) |

**Complete 3 units of core coursework:** 

- RNR 696A (2) Ecosystem Genomics Seminar, fall 
- EIS 596A (1) Ecosystem Genomics Seminar, spring
Complete 3 courses, choosing at least one course from each of three of the following four areas (to be chosen in conjunction with major and minor advisor/doctoral advising committee) for a minimum of 8 units.

All courses already exist and are taught regularly in person on the UArizona main campus. We have reached out to instructors and unit/department heads to confirm that the graduate certificate would not create enrollment challenges. Letters of support are included.

11 units required (3 core + 8 or more elective units)

1. Communication & Dissemination
- ENVS 508 (3) Scientific Writing for Env., Ag., & Life Sciences
- ENVS 515 (3) Translating Environmental Science
- WSM/GEOS 595E (currently 1, will become 3 after fall 2021) Scientific Writing (Topics in Dendrochronology)
- INFO 520 (3) Ethical Issues in Information
- INFO 536 (3) Data Science and Public Interests

2. Theory & Concepts: Ecosystem & Earth Science
- ENVS 511 (3) Environmental Metabolomics
- ENVS 510 (3) Microbial Biogeochemistry and Global Change
- RNR 558 (3) Ecosystem Ecology and a Sustainable Future
- ENVS 525 (3) Environmental Microbiology
- ECOL 578 (3) Global Change
- ATMO 536A (3) Fundamentals of Atmospheric Sciences
- GC 530 (3) The Climate System
- GC 597A (3) Global Change Research, Application, and Decision Making

3. Theory & Concepts: Genomic Biology
- ECOL 553 (4) Functional and Evolutionary Genomics
- ECOL 596A (1) Evolutionary Ecology
- ECOL 600A (3) Fundamentals of Evolution
- ECOL 565 (3) Phylogenetic Biology
- EIS 544 (3) Insect Ecology
- PLP 550 (4) Principles of Plant Microbiology

4. Tools & Data: Data Analytics
- BE 534 (3) Biosystem Analytics
- BE 587 (3) Metagenomics: From Genes to Ecosystems
- ECOL 580 (3) Mathematical Models in Biology
- ENVS 567 (3) Introductory Statistics & Multivariate Statistics with R (undergoing course name change to Statistical analysis of ecological and environmental data with R)
- INFO 533 (3) Medical On-Line Searching
- INFO 544 (3) Informatics in Biology
- INFO 597 (1-6) Biodiversity Informatics

Research methods, data analysis, and methodology requirements (Yes/No). If yes, provide description.

Yes, integrated into the required Ecosystem Genomics seminar and delivered through training for their majors.

Internship, practicum, applied course requirements (Yes/No). If yes, provide description.

No

Additional requirements (provide description)

No
### IV. CURRENT COURSES

Using the table below, list all existing courses included in the proposed minor. You can find information to complete the table using the **UA course catalog** or **UAnalytics (Catalog and Schedule Dashboard) > “Printable Course Descriptions by Department” On Demand Report; right side of screen**. If the courses listed belong to a department that is not a signed party to this implementation request, upload the department head’s permission to include the courses in the proposed minor and information regarding accessibility to and frequency of offerings for the course(s). Upload letters of support/emails from department heads to the “Letter(s) of Support” field on the UAccess workflow form. Add rows to the table, as needed.

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<th>Course prefix and number (include cross-listings)</th>
<th>Units</th>
<th>Title</th>
<th>Course Description</th>
<th>Pre-requisites</th>
<th>Modes of delivery (online, in-person, hybrid)</th>
<th>Typically offered (F, W, Sp, Su)</th>
<th>Dept. signed party to proposal?</th>
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<tr>
<td>ATMO 536A</td>
<td>3</td>
<td>Fundamentals of Atmospheric Sciences</td>
<td>Broadly covers fundamental topics in the atmospheric sciences. Topics include composition of the atmosphere, atmospheric thermodynamics, atmospheric chemistry, cloud physics, radiative transfer, atmospheric dynamics, and climate. Graduate-level requirements include additional questions on homework and exams plus a term paper on a specialized research topic.</td>
<td>none listed</td>
<td>in person</td>
<td>Sp</td>
<td>Yes</td>
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<tr>
<td>BE 534</td>
<td>3</td>
<td>Biosystem Analytics</td>
<td>This course provides a comprehensive introduction to Python for data analytics focused on the interpretation of biological data. The course is structured as a series of short lectures covering key concepts and analytical strategies using Python and cutting-edge open source packages for data analytics. The majority of the course focuses on hands-on exercises both in- and out-of class to develop practical coding skills for interpreting and analyzing high-dimensional biological data. Students work in a collaborative learning classroom to gain skills in (1) basic Unix and Python, (2) Python data structures functions, and files, and (3) data wrangling and visualization using IPython, NumPy, and pandas, and (4) analytics using machine-learning methods available in Scikit-Learn.</td>
<td>Online introduction to Linux. Code academy's Intro to Unix or Command line bootcamp. Apple or Linux computer or Windows machine with Putty. An introductory programming class in python is useful but not required.</td>
<td>in person</td>
<td>F</td>
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<tr>
<td>BE 587</td>
<td>3</td>
<td>Metagenomics: From Genes to Ecosystems</td>
<td>Environmental genomics is revolutionizing our understanding of microbes from the environment to human health, towards a holistic view of ecosystems or &quot;One-Health&quot;. At its core are new molecular methods called metagenomics to sequence DNA directly from an environmental sample, thus capturing the whole microbial community and bypassing culture. Modern (Next-Gen) sequencing technologies offer vast new datasets of short sequence reads representing these microbial communities, however many hurdles exist in interpreting data with high species complexity and given specialized software for microbial metagenomic analyses. This course focuses on the science of metagenomics towards understanding (1) questions that metagenomics can address, (2) possible approaches for metagenomic sequencing and analysis, and (3) how genes, pathways, and environmental context are translated into ecosystem-level knowledge. This course alternates between traditional lectures and hands-on experience with programming, bioinformatics tools, and metagenomic analysis. The course concludes with several weeks of seminar-format discussions on current research in metagenomic data analysis and a final project of your choice analyzing real-world experimental data.</td>
<td>none listed</td>
<td>in person</td>
<td>F (not in Fall 2021, offered Spring 2022)</td>
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<tr>
<td>ECOL 578</td>
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<td>Global Change Analysis of the Earth system through an examination of its</td>
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</tbody>
</table>
Component parts (particularly climate and biogeochemistry) and their interactions with human activities, emphasizing information needed to understand modern and future environmental changes. Graduate-level requirements include an in-depth written exercise and additional activities as described in the syllabus.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisite</th>
<th>Format</th>
<th>Offered</th>
<th>Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOL 553</td>
<td>4</td>
<td>Functional and Evolutionary Genomics</td>
<td>Computational, functional, and evolutionary approaches to genomics, including bioinformatics and laboratory methods relevant to many modern research approaches in biology. Graduate-level requirements include students completing independently designed lab exercises and relate these to the primary literature in a paper. Undergraduate students will only complete defined lab exercises.</td>
<td>Concurrent registration, ECOL 553L for 1st yr. IGERT fellows. While stated in the catalog, this requisite no longer applies.</td>
<td>in person</td>
<td>F</td>
<td>Yes</td>
</tr>
<tr>
<td>ECOL 600A</td>
<td>3</td>
<td>Fundamentals of Evolution</td>
<td>The fundamentals of modern Evolutionary Biology, including molecular evolution, phylogenetics, macroevolution, and population/quantitative genetics. Graduate-level review of evolution focusing on (i) phenotypic evolution of complex traits, and (ii) molecular evolution.</td>
<td>Graduate status in EEB or related department.</td>
<td>in person</td>
<td>Sp</td>
<td>Yes</td>
</tr>
<tr>
<td>ECOL 565</td>
<td>3</td>
<td>Phylogenetic Biology</td>
<td>Concepts in phylogenetic biology, focusing on the phylogenetic (evolutionary) tree of species. The form of the tree, character evolution, speciation, and gene trees. Graduate-level requirements include a more in-depth term paper.</td>
<td>none listed</td>
<td>in person</td>
<td>Sp, even years</td>
<td>Yes</td>
</tr>
<tr>
<td>ECOL 580</td>
<td>3</td>
<td>Mathematical Models in Biology</td>
<td>For advanced undergraduates and graduate students in biological and ecological sciences, and math students: learn how to apply basic tools of mathematical tools (from simple back-of-the-envelope estimates to formal stability analysis using difference and differential equations) to biological problems including population</td>
<td>MATH 129</td>
<td>in person</td>
<td>Sp</td>
<td>Yes</td>
</tr>
<tr>
<td>Course Code</td>
<td>Credits</td>
<td>Course Title</td>
<td>Description</td>
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<tr>
<td>ECOL 596A</td>
<td>2</td>
<td>Evolutionary Ecology</td>
<td>This seminar-style graduate-level course will explore standing questions at the interface of ecology and evolution, with an emphasis on how evolutionary processes affect the ecology that we observe in natural populations. Underlying concepts will be reviewed briefly in lectures by the instructor, but the majority of class time will be spent discussing current literature and major questions in the field.</td>
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<tr>
<td>EIS 544</td>
<td>3</td>
<td>Insect Ecology</td>
<td>The study of how variation in the environment, interactions with other species and the special features of insect &quot;design,&quot; have determined the evolution of diverse insect life histories, the dynamics of insect population and the roles of insects in communities.</td>
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<tr>
<td>ENVS 508</td>
<td>3</td>
<td>Scientific Writing for Env., Ag., &amp; Life Sciences</td>
<td>Effective writing is a valuable tool for any student aspiring for a career in the Environmental, Agricultural, and Life Sciences. This course will cover in-depth technical writing skills needed for scientific writing success, ranging from how to perform comprehensive reviews of the scientific literature, to performing peer reviews of the writing of fellow students. Ultimately, completion of this course will improve students' ability to write technical reports, theses and dissertations, and journal articles. Graduate-level requirements include work on theses, dissertations or journal articles.</td>
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<tr>
<td>ENVS 515</td>
<td>3</td>
<td>Translating Environmental Science</td>
<td>Scientists speak a different language, a dialect filled with abstract symbolism, hypotheses and references to Latin and Greek. In this course, students learn</td>
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</table>
journalism techniques to translate environmental science topics into language a layperson could appreciate. The writing concepts will apply to any field of science, as well as grant proposals, public reports and media including web-based publishing. Students also learn techniques for converting numbers into relevant statistics. Students will "workshop" in groups and work closely with the instructor to produce publication-quality articles on assigned or agreed-upon topics. The best of these could be posted on university-affiliated websites, with credit given to the author. Graduate-level requirements include an additional final project writing a grant proposal or writing a feature article for a specified magazine or newspaper worth 50 points and a higher level of expectation regarding writing and reviews of their peers' work.

<table>
<thead>
<tr>
<th>ENVS 511</th>
<th>3</th>
<th>Environmental Metabolomics</th>
<th>This is a 3 credit hours course aimed to provide an introduction to metabolomics, describes the tools and techniques we use to study the metabolome and explains why we want to study it.</th>
<th>CHEM 142/144 or CHEM 152 or CHEM 162/164 and MCB 181R; or equivalent or instructor consent</th>
<th>in person</th>
<th>Sp</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 510</td>
<td>3</td>
<td>Microbial Biogeochemistry and Global Change</td>
<td>Microbes are the drivers of planetary biogeochemistry. They produce half the oxygen on the planet, and fix half the carbon. They introduce bioavailable forms of nitrogen into the biosphere. If human life ceased to exist, the central biogeochemical cycles would continue turning. However, while the planet's biogeochemistry can persist readily in the absence of human life, that does not mean that humankind's presence lacks impact. The Anthropocene (era of human impact) has seen significant changes to planetary stocks and fluxes</td>
<td>Background in biology or biogeochemistry, and openness to interdisciplinary learning.</td>
<td>in person</td>
<td>F</td>
<td>Yes</td>
</tr>
</tbody>
</table>
of C, N, S, etc. Many of these changes involve or impact microbes, and have significant impacts on biogeochemical cycles. To understand microbial biogeochemistry in today's world, one must include the context of global change. And, conversely, one cannot understand the trajectory of global change without understanding microbial feedbacks via biogeochemical cycles. In this interdisciplinary undergraduate and graduate class we will cover major microbial biogeochemical cycles, and how these cycles are impacted by, and feedback to, global change. To understand the research in this area, we will discuss current methods in both microbial ecology and biogeochemistry, ranging from molecular meta-omics to the use of isotopes as biogeochemical tracers, with a particular emphasis on the challenges and opportunities of integrating these two disciplines. Lectures will be mixed with journal club-style readings and discussions, so active participation is essential. This course is designed for graduate students from diverse backgrounds and advanced undergraduates.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
<th>Course Title</th>
<th>Description</th>
<th>Requirements</th>
<th>Delivery</th>
<th>Grading</th>
<th>Prerequisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 525</td>
<td>3</td>
<td>Environmental Microbiology</td>
<td>Current concepts in water quality, aerobiology and microbial biogeochemistry. Graduate-level requirements include extra journal readings and more comprehensive exams.</td>
<td>none listed</td>
<td>online</td>
<td>F</td>
<td>ENVS 275 or MATH 263, an introductory college-level, statistics course, or instructor consent</td>
</tr>
<tr>
<td>ENVS 567</td>
<td>3</td>
<td>Introductory Statistics &amp; Multivariate Statistics with R</td>
<td>The course (3-unit class) will teach the fundamentals of coding and programming using the R language (<a href="https://www.r-project.org/">https://www.r-project.org/</a>). The students will use code examples and practice problems to understand the statistical as well as the scientific viewpoint. Using R, students will explore and visualize real-world data and derive meaningful interpretations. The course will cover introductory statistics (descriptive statistics, regression, ANOVA, etc.) and advanced topics such as multivariate analysis.</td>
<td>ENVS 275</td>
<td>in person</td>
<td>Sp</td>
<td>Yes</td>
</tr>
<tr>
<td>Course Code</td>
<td>Credits</td>
<td>Course Title</td>
<td>Description</td>
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<tr>
<td>GC 530</td>
<td>3</td>
<td>The Climate System</td>
<td>Systematic examination of processes and circulations comprising Earth's climate. Emphasis on circulations influencing geographic processes using examples of atmospheric environmental issues. Graduate-level requirements include the completion of a term paper.</td>
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<tr>
<td>GC 597A</td>
<td>3</td>
<td>Global Change Research, Application, and Decision-Making</td>
<td>Integrative experience for natural and social science students with focus on local and regional consequences of global change.</td>
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<tr>
<td>INFO 520</td>
<td>3</td>
<td>Ethical Issues in Information</td>
<td>This course presents an overview and understanding of the intractable and pressing ethical issues as well as related policies in the information fields. Emerging technological developments in relation to public interests and individual well-being are highlighted throughout the course. Special emphasis is placed on case studies and outcomes as well as frameworks for ethical decision-making.</td>
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<tr>
<td>INFO 533</td>
<td>3</td>
<td>Medical On-Line Searching</td>
<td>This course will focus on the online retrieval and evaluation of medical literature and the issues surrounding provision of timely, relevant, peer-reviewed medical information. Emphasis will be on the development of the intellectual acuity required to provide physicians, nurses, pharmacists, allied health professionals, medical researchers and consumers with targeted responses to medical queries. Current search modalities such as Evidence-Based Medicine will be covered both in readings and in class discussions.</td>
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<tr>
<td>Course Code</td>
<td>Units</td>
<td>Course Title</td>
<td>Description</td>
<td>Delivery Mode</td>
<td>Days</td>
<td>Term</td>
<td>Notes</td>
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<tr>
<td>INFO 536</td>
<td>3</td>
<td>Data Science and Public Interests</td>
<td>This course focuses on the use of modern data science methods to help learners make socially responsible decisions and mitigate harm that arises from issues like bias, discrimination, and threats to one's personal privacy. More and more individuals are needing to make data-driven decisions in a wide variety of contexts including non-governmental organizations, not-for-profit industries, human services, environmental organizations, refugee camps, and more. Students in this class will thus learn about data science and how it can be utilized in contexts where socially-good decisions are desired and emphasized. This active learning class is designed for students who have an interest in the topic but who may have little to no previous experience with data science or programming.</td>
<td>none listed</td>
<td>in person</td>
<td>F</td>
<td>Yes</td>
</tr>
<tr>
<td>INFO 544</td>
<td>3</td>
<td>Informatics in Biology</td>
<td>Analyze genomic sequences through understanding and using a variety of bioinformatics algorithms and software tools. Interdisciplinary approach integrating informatics, statistics, and biology. Graduate-level requirements include leading a discussion on a current paper or give a tutorial on a bioinformatics tool as part of the Major Concept Exercises category.</td>
<td>none listed</td>
<td>in person</td>
<td>F</td>
<td>Yes</td>
</tr>
<tr>
<td>INFO 597</td>
<td>1-6</td>
<td>Biodiversity Informatics</td>
<td>Modern science has always been data driven but advances in data gathering tools from ground sensors to aerial-based remote sensing increase the researchers' opportunities and responsibility for the professional management of data to support the reproducibility and validity of science. In this course, biology, engineering, and information science</td>
<td>none listed</td>
<td>in person</td>
<td>Su</td>
<td>Yes</td>
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</tbody>
</table>
students will learn to design and implement research methodologies for field research that effectively combine 1) the discovery and use of existing data with 2) the collection, organization, analysis, dissemination, and preservation of field generated research data. These research methodologies will be implemented/studied within the motivating context of behavioral wildlife observation research. Working in teams, students will build, program and deploy microcontroller-based field sensors to gather animal behavioral information in challenging field conditions. Students will use tools such as R and Jupyter Notebooks to add metadata, document data for publication and deposit the data in a trusted data repository.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Credits</th>
<th>Course Title</th>
<th>Description</th>
<th>Prerequisite</th>
<th>Delivery Mode</th>
<th>Semester</th>
<th>Pre-Reqs</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLP 550</td>
<td>4</td>
<td>Principles of Plant Microbiology</td>
<td>This course deals with the mechanisms that plants and associated microorganisms use to establish detrimental or beneficial relationships from the molecular level to the population level. Classical and contemporary research are used extensively to evaluate contemporary and emerging theories.</td>
<td>PLP 305 or consent of instructor</td>
<td>in person</td>
<td>Sp, odd years</td>
<td>Yes</td>
</tr>
<tr>
<td>RNR 558</td>
<td>3</td>
<td>Ecosystem Ecology and a Sustainable Future</td>
<td>Rapid changes to Earth’s biosphere will influence how natural and managed ecosystems function and alter the services they provide. Issues from conservation biology to sustainability and global climate change rely on a comprehensive understanding of ecosystem processes. In this class, students will learn the principles of terrestrial ecosystem ecology, examining the influence of biological, ecological, and physical processes on energy and material flows and water and elemental (carbon, nitrogen, phosphorous) cycling in ecosystems.</td>
<td>none listed</td>
<td>in person</td>
<td>Sp</td>
<td>Yes</td>
</tr>
</tbody>
</table>
V. NEW COURSES NEEDED - using the table below, list any new courses that must be created for the proposed program. If the specific course number is undetermined, please provide level (i.e., CHEM 6**). Add rows as needed. Is a new prefix needed? If so, provide the subject description so Curricular Affairs can generate proposed prefix options.

No new courses are required. We expect that our spring companion course to RNR 696A will use an existing prefix and course number.

VI. FACULTY INFORMATION - complete the table below. If UA Vitae link is not provided/available, attach a short CV (2-3 pages) to the end of the proposal or upload to the workflow form. UA Vitae profiles can be found in the UA directory/phonebook. Add rows as needed. NOTE: full proposals are distributed campus-wide, posted on committee agendas and should be considered “publicly visible”. Contact the Office of Curricular Affairs you have concerns about CV information being “publicly visible”.

<table>
<thead>
<tr>
<th>Faculty Member</th>
<th>Involvement</th>
<th>UA Vitae link or &quot;CV attached&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Elizabeth Arnold</td>
<td>Teach PLP 550, Faculty advisor, Instructor, Co-chair, GIDP</td>
<td><a href="https://profiles.arizona.edu/person/fungi">https://profiles.arizona.edu/person/fungi</a></td>
</tr>
</tbody>
</table>
VII. STUDENT LEARNING OUTCOMES AND CURRICULUM MAP - describe what students should know, understand, and/or be able to do at the conclusion of this minor. Work with the Office of Instruction and Assessment to create a curricular map using Taskstream. Include your curricular map in this section.

Upon concluding the minor in Ecosystem Genomics, doctoral students will:

1. Apply the principles of scientific collaboration and interdisciplinarity, with knowledge of risks and benefits
2. Communicate effectively about ecosystem genomics with diverse peers, stakeholders, partners, mentees, and scientists
3. Identify and develop strategies for addressing grand challenges in sustainability and innovation, for which ecosystem genomics can provide solutions
4. Use, interpret, and communicate the core conceptual, theoretical, analytical, computational, and data elements of ecosystem genomics

These will be achieved via the curriculum, as mapped below. Students will take two successive semesters of the Ecosystem Genomics seminar course (RNR 696A, 2 credits) in fall semester and the companion Ecosystem Genomics (EIS 596A, 1 credit) in spring, with most topics introduced or introduced and practiced in the first semester and practiced and assessed in the second semester. Concurrently or thereafter, they will take electives, choosing one course from three of four core areas at the discretion/direction of their major and minor advisors.

The comprehensive exam for the Ecosystem Genomics GIDP minor may take the form of a written question or a portion of a question with a focus on ecosystem genomics, and/or having
elements of ecosystem genomics in the research proposal, at the discretion of the minor representative and the committee. It also is expected that ecosystem genomics will be represented as a theme in the oral exam, at the discretion of the faculty representing the GIDP minor. This may take the form of a series of questions or discussion points between the student and minor representative with respect to ecosystem genomics.

Courses and outcomes are mapped below for the minor. RNR 696A as the Ecosystem Genomics seminar is listed for both fall and spring, but the spring course is now listed as EIS 596A.

### Ecosystem Genomics Minor

<table>
<thead>
<tr>
<th>Courses and Activities Mapped to Ecosystem Genomics Minor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcome</strong></td>
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<tr>
<td>--------------</td>
</tr>
<tr>
<td>RNR 696A</td>
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<td>RNR 696A</td>
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<td>RNR 696A</td>
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<tr>
<td>Core course</td>
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<tr>
<td>EIS 596A</td>
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<td></td>
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<tr>
<td>Core course</td>
</tr>
</tbody>
</table>

#### VIII. ASSESSMENT PLAN FOR STUDENT LEARNING
- Using the table below, provide a schedule for program assessment of intended student learning outcomes 1) while students are in the program and 2) after completion of the minor. Add rows as needed.

<table>
<thead>
<tr>
<th>Learning Outcomes</th>
<th>Sources(s) of Evidence</th>
<th>Assessment Measures</th>
<th>Data Collection Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome 1:</td>
<td>- Course-embedded</td>
<td>- Formative and summative assessments including discussions, discourse, and presentations in the core course</td>
<td>- Upon declaration and completion of the minor</td>
</tr>
<tr>
<td></td>
<td>assessments in the core course, Ecosystem Genomics Seminar (RNR 696A and EIS 596A)</td>
<td></td>
<td>- In core course</td>
</tr>
<tr>
<td></td>
<td>- Student: Pre- and post questionnaires</td>
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</tr>
</tbody>
</table>
| Outcome 2: Communicate effectively about ecosystem genomics with diverse peers, stakeholders, partners, mentees, and scientists | - Course-embedded assessments in the core course, Ecosystem Genomics Seminar (RNR 696A and EIS 596A)  
- Student: Pre- and post questionnaires  
- Minor advisor: evaluation during oral comprehensive exam | - Formative and summative assessments including discussions, discourse, and presentations in the core course  
- Self-reflection and ranking of communication  
- Successful passing of the oral exam | - Upon declaration and completion of the minor  
- In core course  
- Oral comprehensive exam |

| Outcome 3: Identify and develop strategies for addressing grand challenges in sustainability and innovation, for which ecosystem genomics can provide solutions | - Course-embedded assessments in the core course, Ecosystem Genomics Seminar (RNR 696A and EIS 596A)  
- Student: Pre- and post questionnaires  
- Minor advisor: evaluation during oral comprehensive exam | - Formative and summative assessments including discussions, discourse, and presentations in the core course  
- Self-reflection and questionnaire responses  
- Successful passing of the oral exam | - Upon declaration and completion of the minor  
- In core course  
- Oral comprehensive exam |

| Outcome 4: Use, interpret, and communicate the core conceptual, theoretical, analytical, computational, and data elements of ecosystem genomics | - Course-embedded assessments in the core course, Ecosystem Genomics Seminar (RNR 696A and EIS 596A)  
- Student: Pre- and post questionnaires  
- Minor advisor: evaluation during oral comprehensive exam | - Formative and summative assessments including discussions, discourse, and presentations in the core course  
- Self-reflection and questionnaire responses  
- Successful passing of the oral exam | - Upon declaration and completion of the minor  
- In core course  
- Oral comprehensive exam |
IX. **ANTICIPATED STUDENT ENROLLMENT** - complete the table below. What concrete evidence/data was used to arrive at the numbers?

<table>
<thead>
<tr>
<th>5-YEAR PROJECTED ANNUAL ENROLLMENT: DOCTORAL STUDENTS</th>
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</thead>
<tbody>
<tr>
<td><strong>Number of Students</strong></td>
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</table>

*Data/evidence used to determine projected enrollment numbers:* The Ecosystem Genomics PhD Minor is motivated by a 5-year NSF training grant, which will fund approximately 3-4 doctoral fellows and engage approximately 3-4 additional doctoral participants per year.

X. **ANTICIPATED MINORS AWARDED** - complete the table below, beginning with the first year in which the minor will be awarded. How did you arrive at these numbers? Take into consideration departmental retention rates.

<table>
<thead>
<tr>
<th>PROJECTED MINORS AWARDED ANNUALLY: DOCTORAL STUDENTS</th>
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<tbody>
<tr>
<td><strong>Number of Minors</strong></td>
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</table>

*Data/evidence used to determine number of anticipated minors awarded annually:* We anticipate that currently enrolled graduate students spanning at least nine units on the UArizona campus (EEB, EIS, SPLS, BE, HAS, ENVS, SNRE, INFO, and GEOG) may wish to adopt the new program as their doctoral minor. These will be first-year doctoral students, entering their second semester, such that their graduation dates will be in y5+ of the existence of this program.

XI. **PROGRAM DEVELOPMENT TIMELINE** - plans and timelines for 1) marketing the minor and 2) student recruitment activities.

The Ecosystem Genomics GIDP recruitment team will contact colleagues at the University of Arizona and other universities; ask GIDP faculty to recruit for the program; request REU program coordinators to share information with their students; and advertise the minor on organizational listservs such as the Ecological Society of America, American Society for Microbiology, and Out in STEM to enhance recruitment of students to existing UArizona graduate majors relevant to ecosystem genomics, with the added opportunity to then minor in the GIDP.

The program will send a representative to recruit at the Annual Biomedical Research Conference for Minority Students (ABRCMS), the Society for Advancement of Chicanos/Hispanics, Native Americans in Science (SACNAS), and/or the American Indian Science and Engineering Society (AISES) as funds permit through fall 2025. The marketing and recruitment process is motivated initially by a five-year training grant. Doctoral fellows and participants accepted into this training grant will automatically be enrolled into the Ecosystem Genomics GIDP PhD minor and will make up most of the students accepted through 2025.

Sample Marketing and Recruitment Timeline

**Summer 2021**
Update website ahead of recruitment season
Confirm and activate GIDP leadership team
Fall 2021 (pending approval)
Enroll current PhD students in the fall core course, RNR 696A (Ecosystem Genomics Seminar, 2 credits)
Share flyer/brochure and announcements with Directors of Graduate Studies
Confirm GIDP faculty commitment and host organizational meeting for GIDP faculty
Present GIDP as an exciting opportunity for prospective students SACNAS, AISES, peer institutions that are minority-serving, etc.
Communicate with graduate programs admission committees, directors of graduate studies, and graduate program coordinators about sharing GIDP information with PhD applicants to their programs
Remind GIDP faculty and graduate program coordinators to direct PhD applicants to GIDP website
Advise active PhD students in the minor to enroll in elective(s) for spring

Spring 2022
Host online informational meeting for interested applicants to the GIDP who are applying to partner PhD majors at UArizona
Host online informational meeting for faculty who may wish to join the GIDP; vote in January and at annual intervals thereafter
Enroll current PhD students who have chosen the minor in the spring core course, EIS 596A (Ecosystem Genomics Seminar, 1 credit); host social event
Convene GIDP advisory/assessment teams and evaluate program recruitment and marketing
Offer informational and social opportunity via Zoom for PhD applicants; offer tours and social activities to interested students
Finalize fall cohort for fall 2023

Summer 2022
Assess recruitment and marketing success; evaluate diversity and revise strategies as needed
Update recruitment and marketing approaches.
Host all-GIDP meeting with presentations, social activities, and professional training for all GIDP faculty and students. Repeat all above.

XII. DIVERSITY AND INCLUSION - describe how you will recruit diverse students and faculty to this program. In addition, describe retention efforts in place or being developed in order to retain students.

Achieving a diverse GIDP requires focused efforts to find and recruit students. All participating departments/doctoral majors have room to improve diversity, inclusion, equity, and representation among their graduate students, a process that will be aided by this GIDP as a recruitment tool. Such improvements are critical to our vision of successfully implementing this program.

Our GIDP Co-chairs are mindful of this goal and already have established partnerships with Michelle Higgins, UArizona Office of Societal Impact, and Frans Tax, UArizona Graduate College. Their insight and guidance will enhance our efforts to develop recruitment strategies that grow the diversity of the GIDP and its affiliated majors.

We will work closely with the UArizona Graduate College to engage underrepresented-in-STEM students, with four main strategies: reaching out directly to diversity-serving conferences and institutions; presenting the GIDP program to STEM students in UArizona’s cultural centers and at regional peer institutions that are minority serving; working closely with the UArizona Graduate College to develop and leverage complementary funds for underrepresented minority students; and providing student support in the form of a trained program manager/program coordinator with a strong background in inclusion initiatives in STEM.
## ARIZONA PEER COMPARISON FORM

**Graduate Minor Peer Comparison Chart:** select two peers for completing the comparison chart from (in order of priority) ABOR-approved institutions, AAU members, and/or other relevant institutions recognized in the field. The comparison chart will be used to identify typically required coursework, themes, and experiences for minor programs within the discipline. The comparison programs are not required to have the same minor name as the proposed UA program. Information for the proposed UA program must be consistent throughout the proposal documents.

<table>
<thead>
<tr>
<th>Minor name, institution</th>
<th>Proposed UA Program: Ecosystem Genomics PhD GIDP Minor</th>
<th>Peer 1: Northern Arizona University Ecological and Environmental Informatics (EEI) T3 Option for PhD students in Informatics</th>
<th>Peer 2: Environmental Life Sciences PhD program at Arizona State University</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current # of enrolled students</td>
<td>11</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Minor program description</td>
<td>The <strong>Ecosystem Genomics GIDP PhD Minor</strong> will support and train diverse, outstanding doctoral students in <strong>ecosystem genomics</strong>, an emergent discipline that integrates across biotic systems from genes to ecosystems to solve grand challenges in sustainability and innovation in a rapidly changing world. As an innovative, interdisciplinary area of study, ecosystem genomics represents the synthesis of ecosystem- and genomic sciences via the tools of computational biology, modeling, data science, experiments, theory, applications, and the approaches and power of ‘big data’ in a collaborative and convergent framework. The <strong>ultimate aim</strong> of the Ecosystem Genomics GIDP is to foster a new generation of diverse transdisciplinary scientists to address the challenges of sustaining natural and managed ecosystems on which humans depend, including wildlands, agricultural systems, forests, arid lands, and marine environments. The coursework supported by this minor will help students think across scales from ‘genes to ecosystems’ as they develop skills in interdisciplinarity, scientific communication, and collaboration. At is core the minor will foster and extend students’ excellence in areas such as data science, microbiology, plant sciences, insect science, environmental science, atmospheric science,</td>
<td>The T³ option in Ecological and Environmental Informatics enhances the Informatics (INF) PhD program at NAU, providing innovative training in informatics, ecology, team-based research, and communication. It is funded by the prestigious National Science Foundation’s Research Traineeship (NRT) program, as is the initial phase of the Ecosystem Genomics NRT at the University of Arizona, through which the Ecosystem Genomics GIDP Minor is being initiated. Students enrolled in the INF PhD program with an emphasis in Ecological and Environmental Informatics have the opportunity to enhance their training through coursework in team science and communication along with cohort-building activities. <strong>Goal:</strong> The EEI T3 option seeks to train students to independently and collaboratively leverage cutting-edge informatics tools with skills and knowledge of ecology and related environmental science disciplines to address the most pressing environmental issues facing societies today. This program differs from the Ecosystem Genomics GIDP proposed for the University of Arizona in several key ways. • T3 is an option within an informatics major, rather than a minor for students in diverse STEM majors. • T3 is oriented distinctively toward informatics and computation, providing informatics students with ecological and ecosystem thinking skills and context. In contrast, the UArizona</td>
<td>The Environmental Life Sciences PhD program is a unique degree that trains students to solve complex environmental challenges and explore ecological questions in the context of natural and human-caused environmental change. Environmental Life Sciences is an interdisciplinary program providing focused training on ecological and environmental questions in a changing world. 84 credits are required, including one core class, electives, seminars, reading groups and research. We encourage you to explore and solve complex questions in the context of natural and anthropogenic environmental change. This program differs from the Ecosystem Genomics GIDP proposed for the University of Arizona in several key ways. • This PhD major does not explicitly train students in the convergent, emergent science of ecosystem genomics. • Electives in the ASU program center on geology, hydrology, behavior, physiology, evolutionary biology/population genetics, ecology, ecosystem science, and sustainability. They are not explicitly oriented specifically to interdisciplinary training, training in collaboration, development of complementary skill sets in genomics and ecosystem sciences, data science, or ‘big data’ -- the strengths of the UArizona proposed GIDP.</td>
</tr>
</tbody>
</table>

---

**Note:** The comparison data and descriptions are provided for illustrative purposes and should not be considered exhaustive or complete. Please consult the respective institutions’ official documents for the most up-to-date and accurate information.

---

**References:**

1. **Ecosystem Genomics GIDP:** Provides a comprehensive approach to understanding the complex interactions between ecosystems and their environments, focusing on the synthesis of ecosystem and genomic sciences.
2. **Informatics (INF) PhD program at NAU:** Offers a unique emphasis in Ecological and Environmental Informatics, integrating informatics with ecological and environmental science.
3. **Environmental Life Sciences PhD program at Arizona State University:** Combines ecological and environmental studies with informatics, providing a multidisciplinary approach to solving complex environmental challenges.

---

**Further Reading:**

- **Ecosystem Genomics GIDP:** [Program Website](http://example.com)
- **Informatics (INF) PhD program at NAU:** [Program Website](http://example.com)
- **Environmental Life Sciences PhD program at Arizona State University:** [Program Website](http://example.com)
biosystems engineering, ecology and evolutionary biology, geography and informational science, and it is intended to attract students majoring in these UArizona programs. Ultimately the minor will help students translate ideas into meaningful scientific advances while cultivating deep and broad skill sets and promises to prepare students for important roles in solving grand challenges relevant to regional, national, and international issues in sustainability and innovation.

| Minimum total units required | 11 (3 core + 8 or more elective units) | 60+ (option within a graduate major; T3 option itself, see below) | 80+ (graduate major) |
| Pre-admission expectations (i.e., academic training to be completed prior to admission) | Active graduate student with background and training in the field, enrolled as a doctoral student in a relevant graduate program aligned with ecosystem genomics (e.g., but not limited to, EEB, EIS, SPLS, BE, HAS, ENVS, SNRE, INFO, GEOG). | Admitted to INF PhD program | Admitted to the PhD program of the School of Life Sciences |
| Minor requirement s. List all minor requirement s including core and electives. Courses listed must include course prefix, number, units, and title. Mark new coursework (New). Include any limits/ restrictions needed (house number limit, etc.). Provide email(s)/letter(s) of support from home department head(s) for | Active graduate student with a background in ecology, evolutionary biology, entomology, plant sciences, biosystems engineering, hydrology, atmospheric science, environmental science, and/or natural resource management; enrolled as a doctoral student in a relevant graduate program aligned with ecosystem genomics (e.g., but not limited to, EEB, EIS, SPLS, BE, HAS, ENVS, SNRE, INFO, GEOG). | INF Core Requirements: | Core requirement: |
| | | INF501 (Informatics & Computing Seminar), INF502 (Software Development Methodologies), INF503 (Large-scale data structures and organization), INF504 (Data Mining & Machine Learning), INF 511 & 512 (Modern Regression I & II), INF 605 (Professional & Career Development), | ELS 501 Grand Challenges in Environmental Life Sciences |
| | | | Electives: At least two elective courses (3 credit hours each) are required from 500+ level courses related to the following topics: Earth sciences (e.g., geology, hydrology); organismal biology (e.g., physiology and behavior); evolutionary biology (e.g., population genetics); ecology/ecosystems/biogeochemistry; sustainability and social/policy |

Ecosystem Genomics GIDP brings together students in seven STEM graduate majors spanning ecosystem science and genomics and connects them with informatics tools/informatics/computation to train them in the emergent, convergent science of ecosystem genomics. • Thus, the programs are distinct and highly complementary.

Thus, the programs are distinct and highly complementary.
| courses not owned by your department. | Complete 3 units of core coursework:  
-RNR 696A (2) Ecosystems Genomics Seminar, fall  
-EIS 596A (1) Ecosystem Genomics Seminar, spring | Complete 3 electives courses, choosing one course from each of three of the following four areas (to be chosen in conjunction with major and minor advisor/doctoral advising committee) for a minimum of 8 units.  
All courses already exist and are taught regularly in person on the UArizona main campus. We have reached out to instructors and unit/department heads to confirm that the graduate certificate would not create enrollment challenges. Letters of support are included.  
11 units required (3 core + 8 or more elective units)  
Complete 3 units of core coursework:  
-RNR 696A (2) Ecosystems Genomics Seminar, fall  
-EIS 596A (1) Ecosystem Genomics Seminar, spring  
Complete 3 courses, choosing one course from each of three of the following four areas (to be chosen in conjunction with advisor/graduate advising committee) for a minimum of 8 units  
1. Communication & Dissemination  
-ENVS 508 (3) Scientific Writing for Env., Ag., & Life Sciences  
-ENVS 515 (3) Translating Environmental Science  
-WSM/GEOS 595E (currently 1, will become 3 after fall 2021) Scientific Writing (Topics in Dendrochronology)  
-INFO 520 (3) Ethical Issues in Information  
-INFO 536 (3) Data Science and Public Interests  
2. Theory & Concepts: Ecosystem & Earth Science | grad classes and 9 or more credits from INF, CS, EE, BIO, FOR, SES, STA, MAT grad courses. |
### Course List

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVS 511</td>
<td>(3) Environmental Metabolomics</td>
</tr>
<tr>
<td>ENVS510</td>
<td>(3) Microbial Biogeochemistry and Global Change</td>
</tr>
<tr>
<td>RNR 558</td>
<td>(3) Ecosystem Ecology and a Sustainable Future</td>
</tr>
<tr>
<td>ENVS 525</td>
<td>(3) Environmental Microbiology</td>
</tr>
<tr>
<td>ECOL 578</td>
<td>(3) Global Change</td>
</tr>
<tr>
<td>ATMO 536A</td>
<td>(3) Fundamentals of Atmospheric Sciences</td>
</tr>
<tr>
<td>GC 530</td>
<td>(3) The Climate System</td>
</tr>
<tr>
<td>GC 597A</td>
<td>(3) Global Change Research, Application, and Decision Making</td>
</tr>
</tbody>
</table>

### Theory & Concepts: Genomic Biology
- ECOL 553 (4) Functional and Evolutionary Genomics
- ECOL 596A (1) Evolutionary Ecology
- ECOL 600A (3) Fundamentals of Evolution
- ECOL 565 (3) Phylogenetic Biology
- EIS 544 (3) Insect Ecology
- PLP 550 (4) Principles of Plant Microbiology

### Tools & Data: Data Analytics
- BE 534 (3) Biosystem Analytics
- BE 587 (3) Metagenomics: From Genes to Ecosystems
- ECOL 580 (3) Mathematical Models in Biology
- ENVS 567 (3) Introductory Statistics & Multivariate Statistics with R (undergoing course name change to Statistical analysis of ecological and environmental data with R)
- INFO 533 (3) Medical On-Line Searching
- INFO 544 (3) Informatics in Biology
- INFO 597 (1-6) Biodiversity Informatics

### Research methods, data analysis, & methodology requirements. (Yes/No. If yes, provide description)

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes/No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes, integrated into the required Ecosystem Genomics seminar and delivered through training for their majors.</td>
<td>Yes</td>
<td>Yes - coursework in software and statistical methods; course in Ecological Informatics tools and products (INF550)</td>
</tr>
</tbody>
</table>

### Internship, practicum, applied course

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Yes/No</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>requirement (Yes/No). If yes, provide description.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Additional requirements (provide description)</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*Note: comparison of additional relevant programs may be requested.*
**Name of Proposed Program or Unit:** Graduate Interdisciplinary Program: Ecosystem Genomics

**Budget Contact Person:** Heather Ingram, Program Coordinator; A. Elizabeth Arnold and Bonnie Hurwitz, GIDP CO-Chairs

### METRICS

<table>
<thead>
<tr>
<th></th>
<th>1st Year 2021 - 2022</th>
<th>2nd Year 2022 - 2023</th>
<th>3rd Year 2023 - 2024</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net increase in annual college enrollment UG</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Net increase in annual college enrollment Grad</td>
<td>2-5</td>
<td>4-10</td>
<td>6-15</td>
<td></td>
</tr>
<tr>
<td>Net increase in college SCH UG</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Net increase in college SCH Grad</td>
<td>12-30</td>
<td>48-72</td>
<td>72-96</td>
<td></td>
</tr>
<tr>
<td>Number of enrollments being charged a Program Fee</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>New Sponsored Activity (MTDC)</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Number of Faculty FTE</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>Includes admin and instruction. Existing faculty and courses. No new hires or courses.</td>
</tr>
</tbody>
</table>

### FUNDING SOURCES

**Continuing Sources**
- UG RCM Revenue (net of cost allocation)
- Grad RCM Revenue (net of cost allocation)
- Program Fee RCM Revenue (net of cost allocation)
- F and A Revenues (net of cost allocations)
- UA Online Revenues
- Distance Learning Revenues

<table>
<thead>
<tr>
<th></th>
<th>1st Year</th>
<th>2nd Year</th>
<th>3rd Year</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>College fund balances</td>
<td>$28,000</td>
<td>$28,000</td>
<td>$28,000</td>
<td>Non GIDP funded. Allocated by Dean of COS, Head of EEB, and Assoc Dean for Research, CALS Funding towards Program Manager/Coordinator</td>
</tr>
<tr>
<td>Institutional Strategic Investment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gift Funding</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personnel</td>
<td>$70,169</td>
<td>$71,572</td>
<td>$74,003</td>
<td>NSF NRT: Program Manager/Coordinator (.75 FTE) + ERE. Website developer (Indep. Cont.). Funding for personnel for the GIDP will be non-Graduate College/GIDP resources.</td>
</tr>
<tr>
<td>Other Items</td>
<td>$6,500</td>
<td>$6,500</td>
<td>$6,500</td>
<td>Amount includes the Chair stipend amount for the minor ($4,000) and the certificate ($2,500)- in effect the first year students admitted</td>
</tr>
<tr>
<td>Other items continued</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$2,000</td>
<td>$2,000 operations budget from GIDP Admin</td>
</tr>
</tbody>
</table>

Total Continuing: $106,669.00

### EXPENDITURE ITEMS

**Continuing Expenditures**
- Faculty
- Other Personnel | $70,169  | $71,572  | $74,003  | NSF NRT: Program Manager/Coordinator (.75 FTE) + ERE. Website developer (Indep. Cont.). Funding for personnel for the GIDP will be non-Graduate College/GIDP resources. |

**Employee Related Expense**
- Graduate Assistantships
- Operations (materials, supplies, phones, etc.)
- Additional Space Cost
| College fund balances (COS, EEB, and CALS) | $28,000 | $28,000 | $28,000 | Non GIDP funded. Allocated by Dean of COS, Head of EEB, and Assoc Dean for Research, CALS. Funding towards Program Manager/Coordinator. |
| Other Items (attach description) | $6,500 | $6,500 | $6,500 | Amount includes the Chair stipend amount for the minor ($4,000) and the certificate ($2,500). In effect the first year students admitted. |
| Other Items continued | $2,000 | $2,000 | $2,000 | $2,000 operations budget from GIDP Admin. |
| Total Continuing | $106,669.00 | $108,072.00 | $110,503.00 |
| One-time Expenditures |  |
| Construction or Renovation | $0.00 | $0.00 | $0.00 |
| Start-up Equipment | $0.00 | $0.00 | $0.00 |
| Replace Equipment | $0.00 | $0.00 | $0.00 |
| Library Resources | $0.00 | $0.00 | $0.00 |
| Other Items (attach description) |  |
| Total One-time | $0.00 | $0.00 | $0.00 |
| TOTAL EXPENDITURES | $106,669.00 | $108,072.00 | $110,503.00 |
| Net Projected Fiscal Effect | $0.00 | $0.00 | $0.00 | All expenditures covered; no net cost. Gain from SCH and |

*This form includes the budget and expenses for both the GIDP Graduate Certificate and PhD Minor.*

**The GIDP Graduate Certificate is intended to attract students to our participating graduate programs, with the aim of increasing graduate student enrollment in courses offered by units in our partner colleges.*
Hi Scott,

Mike and I will split the $20K/year for the duration of the grants.

Best regards,

Elliott Cheu, Ph.D.
Interim Dean, College of Science
Distinguished Professor of Physics
University of Arizona
(520) 621-4092

On Wed, Oct 21, 2020 at 10:46 AM Antin, Parker B - (pba) <pba@arizona.edu> wrote:

Hi Betsy,

While we don’t directly connect investments such as this to IDC return, the CALS Research Office will be pleased to provide $8000 per year for the next five years to help fund this position.

Best,

Parker
February 5, 2020

Dear Dr. Saleska,

We are pleased to support your team’s proposal to the NSF Research Traineeship program (NRT) in the priority area of Rules of Life (RoL), entitled “NRT-RoL: BRIDGETS – Building Resources for InterDisciplinary training in Genomics and Ecosystem Sciences.”

We commit to collaborating with you to support this important training initiative in concrete ways (see below), and more fundamentally, to advance long-term sustainability of ecosystem genomics as an emerging critical science at University of Arizona (UA), through continued recruitment of new faculty; supporting your team’s endeavors in research, teaching, curriculum development, outreach, and mentorship through the ecosystem genomics initiative; and enhancing and formalizing graduate student training through formation of a new graduate interdisciplinary program (GIDP) in ecosystem genomics.

The University has fostered the growth of an interdisciplinary, interdepartmental faculty cluster in ecosystem genomics: in the last year and a half, we have hired seven new assistant or associate professors across five departments (all of whom are now part of your core team). This represents a multi-million dollar long-term investment in advancing this field at UA, directly illustrating our institutional commitment to recruiting and supporting the kind of faculty needed to make an NRT-catalyzed training program in ecosystem genomics a long-term success.

To support your NSF NRT program in Ecosystem Genomics we will:

- Provide tuition assistance for the NRT trainees in your program, in the form of out-of-state tuition waivers (up to 15 waivers annually). These will reduce non-resident tuition to in-state levels for NRT trainees who are not residents of the state of Arizona. The grant would be responsible for covering in-state tuition and fees for trainees as outlined in your budget.

- Advance the long-term sustainability of ecosystem genomics at UA through ongoing support of tangible initiatives, as showcased by our commitment to hiring new faculty in this field (above).

- Advance recruitment of diverse trainees through the leverage and fostering of strong diversity programs, including UA’s #1 ranking in PhDs awarded to Native Americans, and its recent designation as a Hispanic-Serving Institution. The Graduate College oversees the successful program called University of Arizona/Alfred P. Sloan Indigenous Graduate Partnership (UA/SIGP) that provides fellowships for Native American students to pursue graduate degrees in science, technology, engineering, and mathematics. In addition, the UA Graduate College runs a strong undergraduate diversity mentoring program called the Undergraduate Research Opportunities Consortium (UROC) that works with NSF-affiliated Research Experiences for Undergraduates. The Graduate College office of Diversity and Inclusion, under the directorship of Dr. Frans Tax, commits to work with you to make connections with UROC and UA/SIGP to recruit seniors to the NRT Trainee Program.

- Support your team’s development of curriculum, mentorship, and training, in order to leverage the expertise and advance the aims of the PIs, key personnel, and affiliated faculty relevant to the NRT.

- Support and assist in the creation of a new GIDP, enabling graduate students based in multiple departments across campus to declare and receive a certificate (minor) in Ecosystem Genomics.
We are pleased that you have received additional internal commitments of partnership and collaboration from diverse professionals, leaders, and partners at the UA, including the following:

- **The BIO5 Institute**, directed by **Dr. Jennifer Barton**, which promotes excellence in interdisciplinary biosciences research, translation, and education outreach and training, will provide space (offices and laboratories for faculty and students) and a centralized home for the UA’s Ecosystem Genomics Initiative and cluster hire, and if funded, the proposed NRT. This commitment includes offices for NRT Co-PI’s Wing and Hurwitz, offices for the junior faculty who are among the core personnel of the proposed NRT (BarberanTfaily, Meredith, and U’ren), with office and lab space at BIO5 for NRT PI Saleska. We recognize that the availability of common space for scholars from across different Departments and Colleges is invaluable for fostering the sense community and teamwork that is critical to the success of a program like NRT. In addition, Dr. Barton and BIO5 will support an NRT Ecosystem Genomics Seminar series that will bring 2-3 domestic and international speakers per year to UA, thus providing institutional support for the NRT training program.

- **University of Arizona’s Biosphere 2**, directed by **Joaquin Ruiz**, will provide access to the resources and experimental biomes of Biosphere 2, enabling one of the proposed NRT student research experiences in ecosystem genomics (section C.1.(iii)). Biosphere 2 consists of diverse biomes (desert, savannah, ocean, mangrove, tropical rainforest) and the Landscape Evolutionary Observatory (LEO), which are controlled environments for sampling and studying taxonomic and metabolic diversity in different ecosystem components. These provide a basis for achieving key NRT research goals in genes-to-ecosystem scaling through links to ongoing observations of ecosystem-scale metabolic function (e.g., soil fluxes of greenhouse gases methane, nitrous oxide, carbon dioxide, and water vapor). **Biosphere 2 is also a foundation** for outreach about the globally connected nature of earth’s biosphere to the general public, using Biosphere 2’s biomes as a nexus for connecting with the ~100,000 visitors per year to Biosphere 2’s outreach program;

- **Dr. Uwe Hilgert**, Director of Industry Relations, STEM Training & Workforce Development in BIO5, will assist with coordinating outreach to high school students, connect NRT trainees to career opportunities, and enhance our recruitment and placement of underrepresent students in STEM.

- **Directors/Coordinators/Chairs of Graduate studies** have also agreed to coordinate student recruitment into the NRT of students from participating academic units, including:
  - Drs. Michelle McMahon, Plant Sciences and Plant Pathology, School of Plant Sciences;
  - Dr. Jeremiah Hackett, Associate Department Head, Ecology and Evolutionary Biology;
  - Dr. Marcel Schaap, Environmental Science;
  - Dr. Martha S. (Molly) Hunter, Chair, GIDP in Entomology & Insect Science;
  - Dr. Rachel Gallery, Associate Director, School of Natural Resources & the Environment;
  - Dr. Christopher Castro, Hydrology and Atmospheric Sciences;
  - Dr. Muluneh Yitayew, Biosystems Engineering; and
  - Dr. Lars Fogelin, Anthropology; Dr. Eithne Luibheid, Gender & Women’s Studies

In conclusion, we wish you the best of luck in your proposal submission and look forward to hearing the results of the review of your NRT-RoL proposal at NSF.

Sincerely,

Liesl Folks, PhD, MBA  Andrew Carnie, PhD
Senior Vice President and Provost  Vice Provost/Dean, Graduate Education
October 14, 2021

Dr. Andrew Carnie  
Dean, Graduate College  
Administration 322  
CAMPUS

Dear Andrew:

This letter is to convey my strong support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which I understand will offer both a PhD Minor and a Graduate Certificate.

These tracks will provide interdisciplinary education for students working at the boundary of ecosystem sciences and genomics. We anticipate that some of our graduate students in Geography will be interested in these new options. Also, several of our graduate courses will be included in the recommended list for these GIDP students as options for their minor or certificate, including GEOG 530 The Climate System and GC 597a Global Change Research, Application, and Decision-Making (which is taught by one of our faculty members for the Global Change GIDP).

Based on discussions with our faculty, I don’t foresee any conflicts in curriculum or related matters within our School in relation to the establishment of this new GIDP. As mentioned above, we expect this minor to appeal to certain incoming and current students in our program, which will provide useful links between SGDE and the other participating graduate programs.

Sincerely,

Andrew C. Comrie, Ph.D.  
Professor & Director
September 30, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate. I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

We anticipate that several of our graduate courses will be recommended to GIDP students as optional courses for their minor or certificate:

- INFO 520: Ethical Issues in Information
- INFO 533: Medical On-Line Searching
- INFO 536: Data Science and Public Interests
- INFO 554: Informatics in Biology
- INFO 597: Biodiversity Informatics

I foresee no conflicts in curriculum or related matters within my department with the establishment of this GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

Winslow Burleson, Ph.D.
Professor, Director of Research, & Associate Director, School of Information
04/20/21

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express support for the newly proposed Graduate Interdisciplinary Program (GIDP) in Ecosystem Genomics at the University of Arizona.

The GIDP will train diverse graduate students to think across scales from ‘genes to ecosystems’. By earning a graduate certificate or PhD minor in the emergent science of ecosystem genomics, students will complement and extend their core disciplinary training in a way that we consider highly promising for successful careers in industry positions such as the ones we offer. One of the grand challenges of our company is to sequence the pangenome of the Earth’s microbes and discover novel therapeutics. The cross-cutting skillsets that this GIDP will provide will leave graduates poised to address such challenges at the bench and at the computer.

The coursework and transdisciplinary research supported by this GIDP will help students develop skills in interdisciplinarity, scientific communication, and collaboration while also fostering their excellence in areas such as data science, microbiology, plant sciences, insect science, environmental science, atmospheric science, biosystems engineering, ecology, and evolutionary biology. The GIDP will help students translate ideas into meaningful scientific advances while cultivating deep and broad skill sets via rich coursework and robust mentorship. This GIDP promises to prepare students for important roles in solving grand challenges relevant to regional, national, and international issues in sustainability and innovation. The University of Arizona has already demonstrated excellence in this area, with two recent UA trainees joining Hexagon Bio and bringing powerful insights given their prior interdisciplinary training. By formalizing this type of training and recognizing it in a minor this GIDP promises to help PhD students advertise these skillsets to potential employers.

Our company is excited to see this kind of training program, as we view the skills and training fostered by this GIDP to be key to preparing new generations of diverse scientists to enter a cutting-edge workforce. The University of Arizona’s GIDP in Ecosystem Genomics is innovative and unique, and it will be a welcome addition to graduate training experiences across diverse disciplines.

Sincerely,

Maureen Hillenmeyer, PhD
Co-founder and CEO, Hexagon Bio
April 20, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express support for the newly proposed Graduate Interdisciplinary Program (GIDP) in Ecosystem Genomics at the University of Arizona.

The GIDP will train diverse graduate students to think across scales from ‘genes to ecosystems.’ By earning a graduate certificate or PhD minor in the emergent science of ecosystem genomics, students will complement and extend their core disciplinary training in a way that we consider highly promising for successful careers in industry positions in companies such as Pluton Bio.

The coursework and transdisciplinary research supported by this GIDP will help students develop skills in interdisciplinarity, scientific communication, and collaboration while also fostering their excellence in areas such as data science, microbiology, plant sciences, insect science, environmental science, atmospheric science, biosystems engineering, ecology, and evolutionary biology. The GIDP will help students translate ideas into meaningful scientific advances while cultivating deep and broad skill sets via rich coursework and robust mentorship. This GIDP promises to prepare students for important roles in solving grand challenges relevant to regional, national, and international issues in sustainability and innovation.

Our company is excited to see this kind of training program, as we view the skills and training fostered by this GIDP to be key to preparing new generations of diverse scientists to enter a cutting-edge workforce. The University of Arizona’s GIDP in Ecosystem Genomics is innovative and unique. It will be a welcome addition to graduate training experiences across diverse disciplines.

Sincerely,

Barry Goldman, PhD
CEO/CSO
Pluton Biosciences
MEMORANDUM

Date: March 29, 2021

To: Dr. Andrew Carnie, Dean of the UArizona Graduate College

From: Dr. Matthew A. Jenks, Director for the School of Plant Sciences

Subject: Graduate Interdisciplinary Minor and Certificate in Ecosystem Genomics

Dear Dr. Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate. I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics. We anticipate that one of our graduate courses will be recommended to GIDP students as an optional course for their minor or certificate:

PLP 550: Principles of Plant Microbiology

I foresee no conflicts in curriculum or related matters within my School with the establishment of this GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

Matthew A. Jenks
Director for the School of Plant Sciences
March 13, 2021

Dr. Andrew Carnie, PhD  
Dean, Graduate College  
University of Arizona  
Administration 322  
PO Box 210066  
Tucson, AZ 85721-0066

Dear Andrew:

I am writing to express my full support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

We anticipate that several of our graduate courses will be recommended to GIDP students as optional courses for their minor or certificate:

- RNR 558: Ecosystem Ecology and a Sustainable Future
- RNR 621: Applied Statistics
- RNR 696A: Ecosystem Genomics

I foresee no conflicts in curriculum or related matters within my department with the establishment of this new GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

Willem J.D. van Leeuwen, Interim Director and Professor  
School of Natural Resources and the Environment
March 26, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

I foresee no conflicts in curriculum or related matters within the Indige-FEWSS GIDP with the establishment of the Ecosystem Genomics GIDP. In fact, I expect this program will complement ours and will further connect graduate programs on the University of Arizona campus.

Please contact me at kchief@arizona.edu or 520-247-6030 if you have any questions.

Sincerely,

[Signature]

Karletta Chief, Associate Professor & Extension Specialist
March 16, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

We anticipate that one of our graduate courses will be recommended to GIDP students as an optional course for their minor or certificate:

ATMO 536A: Fundamentals of Atmospheric Sciences

I foresee no conflicts in curriculum or related matters within my department with the establishment of this GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

Thomas Meixner,
Professor and Head
March 15, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

We anticipate that several of our graduate courses will be recommended to GIDP students as optional courses for their minor or certificate:

ENVS 508: Scientific Writing for Env., Ag., & Life Sciences
ENVS 510: Microbial Biogeochemistry and Global Change
ENVS 511: Environmental Metabolomics
ENVS 515: Translating Environmental Science
ENVS 525: Environmental Microbiology

I foresee no conflicts in curriculum or related matters within my department with the establishment of this GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

Jon Chorover
Professor and Head
Department of Environmental Science
Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate. I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

There is considerable overlap of interests between faculty of this proposed GIDP minor and those of our faculty and students in our program, the GIDP in Entomology & Insect Science. We expect that several EIS students will elect the GIDP in Ecosystem Genomics as their minor. We already have an incoming EIS student who will be a fellow in the inaugural NSF supported BRIDGES program cohort.

We also anticipate that one of our graduate courses will be recommended to GIDP EG students as an optional course for their minor or certificate: **EIS 544: Insect Ecology**

The class is regularly offered as part of our existing curriculum and seats are available. I foresee no conflicts in curriculum or related matters within our graduate program with the establishment of this additional GIDP, especially as I understand the plan for the sustainability of this GIDP Minor will not draw from the current GIDP budget.

Instead, I expect this minor will further connect our graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

[Signature]

Martha S. (Molly) Hunter
Professor, Department of Entomology, and Department of Ecology & Evolutionary Biology
Chair, Graduate Interdisciplinary Program in Entomology & Insect Science
mhunter@ag.arizona.edu +1-520-621-9350
April 8, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

We anticipate that several of our graduate courses will be recommended to GIDP students as optional courses for their minor or certificate:

ECOL 553: Functional and Evolutionary Genomics
ECOL 565: Phylogenetic Biology
ECOL 578: Global Change
ECOL 580: Mathematical Models in Biology
ECOL 600A: Fundamentals of Evolution

I foresee no conflicts in curriculum or related matters within my department with the establishment of this GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate program with other participating graduate programs on the University of Arizona campus.

Sincerely,

Dr. Michael Worobey
Department Head
Louise Foucar Marshall Science Research Professor
Ecology and Evolutionary Biology
March 30, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

I foresee no conflicts in curriculum or related matters within the Data Science Institute with the establishment of the Ecosystem Genomics GIDP. In fact, I expect this program will complement our ongoing training and learning activities and will further connect graduate programs on the University of Arizona campus. Students trained in computational and statistical methods in Ecosystem Genomics will also provide valuable capacity of trained students for our campus.

Please feel free to contact me if you need any further information, we look forward to working closely with the Ecosystems Genomics GIDP

Nirav Merchant
Director, UA Data Science Institute (Data 7)
Co-PI NSF CyVerse
University of Arizona
April 12, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Dean Carnie,

I am writing to express my support for the newly proposed Graduate Interdisciplinary Program (GIDP) in Ecosystem Genomics, which will offer both a PhD Minor and a Graduate Certificate.

I understand that these tracks will consist of 12 credit hours over four semesters and will provide interdisciplinary training at the interface of ecosystem sciences and genomics.

We anticipate that two of our graduate courses will be recommended to GIDP students as optional courses for their minor or certificate:

BE 534: Biosystem Analytics
BE 587: Metagenomics: From Genes to Ecosystems

I foresee no conflicts in curriculum or related matters within my department with the establishment of this GIDP. In fact, I expect this minor to appeal to incoming and current students in our program, and further connect our unit and graduate programs with other participating graduate programs on the University of Arizona campus.

Sincerely,

Kathryn L. Farrell-Poe
Head, Specialist, and Professor
April 7, 2021

Dr. Andrew Carnie, PhD
Dean, Graduate College
University of Arizona
Administration 322
PO Box 210066
Tucson, AZ 85721-0066

Dear Andrew:

This letter serves to confirm our support for the proposed Graduate Interdisciplinary Program in Ecosystem Genomics, especially with regard to the Ecosystem Genomics seminar (RNR 696A).

The School of Natural Resources and the Environment is listed as the home unit for the Ecosystem Genomics seminar (RNR 696A), a required course included in the initial curriculum listing for the minor. The seminar, currently taught by Dr. Laura Meredith, is regularly offered as part of our existing curriculum and seats are available.

Sincerely,

Willem J.D. van Leeuwen, Interim Director and Professor
School of Natural Resources and the Environment
REPORT TO FACULTY SENATE

FROM: The SPBAC Co-Chairs, Sabrina Helm and Barry Brummund
DATE: January 19, 2022

SPBAC Charter: The Strategic Planning and Budget Advisory Committee (SPBAC) in consultation and dialogue with the President, the Provost, and the University community, supports and enhances the success of the University through thoughtful and informed advice relating to: strategic planning, assessment of institutional priorities, review of budgetary policies, and the evaluation of programs and services.

ACCOMPLISHMENTS

• SPBAC members completed a survey on options for Student Credit Hour (SCH) distribution following the course owner vs. the course instructor models in AIB (Activity Informed Budgeting). Results of the survey were reported to senior leadership and SPBAC members.
• SPBAC members participated in a three-hour, follow-up workshop organized and led by Garth Perry, Vice President and Chief Budget Officer, on the foundations and implementation of AIB (Activity Informed Budgeting).
• In regular session, SPBAC discussed
  - UArizona’s current ranking in US News Rankings and related strategies
  - State appropriations + net tuition and fee revenue according to a benchmarking report
  - AIB – SCH assignment (Course Owner vs. Course Instructor)
  - AIB – F&A distribution
  - An updated on the Strategic Plan Initiatives
  - State of the budget
  - Investment in Research Cores/RII

2021-2022 GOALS

• To regularly review annual budget changes
• To increase financial/budgetary literacy of SPBAC membership to ensure timely and competent engagement of all members in development of budgetary policies
• To work with administration on a streamlined process for Shared Governance/SPBAC inclusion in important subcomponents of the AIB transition
• To provide consultative input for RII with regard to financial implications of the research mission
• To work with administration on plans for improvement of student retention and graduation metrics
• To consult administration on revenue-generating ventures such as UAGC
• To overall improve the process for shared governance input in budgetary and strategic planning

**SPBAC Meeting Minutes:** The minutes from previous meetings are available for each meeting in our digital archive, available here: [https://facultygovernance.arizona.edu/committee/34/minutes-archive](https://facultygovernance.arizona.edu/committee/34/minutes-archive)
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## Competition Details

**Competition Title:** 2022 Honorary Degrees Nominations  
**Award Cycle:** FY2022  
**Submission Deadline:** 12/3/2021 4:00 PM

## Application Information

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<tr>
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<th>Kaitlin Conrad</th>
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<tr>
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<td>3612</td>
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<tr>
<td>Application Title:</td>
<td>Honorary Doctorate for Adalberto Guerrero</td>
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## Personal Details

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<tr>
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<th>Kaitlin</th>
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<tbody>
<tr>
<td>Applicant Last Name:</td>
<td>Conrad</td>
</tr>
<tr>
<td>Email Address:</td>
<td><a href="mailto:kaconrad@email.arizona.edu">kaconrad@email.arizona.edu</a></td>
</tr>
<tr>
<td>Phone Number:</td>
<td>(520) 626-3853</td>
</tr>
<tr>
<td>College:</td>
<td>Social and Behavioral Sciences</td>
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</table>

## Application Details

**Proposal Title**  
Honorary Doctorate for Adalberto Guerrero

**Candidate Full Name**  
Adalberto M. Guerrero

**Recommended Degree**  
Doctor of Humane Letters
The Department of Mexican American Studies and the College of Social and Behavioral Sciences are pleased to nominate Adalberto (“Beto”) Guerrero for a Doctor of Humane Letters for his outstanding contributions as an educator, mentor, communicator, and a peacemaker. Beto is a pioneer of bilingual education; his reputation was cemented nation-wide with the passage of the Bilingual Education Act, signed into law by President Lyndon B. Johnson on January 2, 1968. The legislation has impacted the education of millions of Hispanic students.

Beto was raised in Bisbee, earning his BA in Spanish from UArizona, after which he taught Spanish at Pueblo High School (PHS). There, he realized that although half of his students were highly proficient in Spanish, they were stigmatized and struggling in other courses. He intuited that if required classes were taught in Spanish, the students’ grades would improve and they’d be better prepared for college. He embarked on teaching methods that were considered radical then, rejecting the traditional preference for Spanish Literature to teach Spanish to using literature written in the Americas about diverse themes and topics that were meaningful to Native Spanish Speakers. The success of PHS’s Spanish for Native Speakers Program was recognized with a National Education Association Pacemaker School Award in 1965. That same year Beto initiated the Bilingual Education Institute to help train bilingual teachers, a program that was in part supported by the National Defense Education Act.

As a member of the faculty at UArizona, Beto taught his methods to others and helped develop courses. In 1973 he was appointed Assistant Dean of Students of Mexican American Affairs, and in 1975 he was asked by UA President Schaeffer to create a committee that was later institutionalized as the Mexican American Studies and Research Center. During these years he also assisted in drafting bilingual education legislation for the State of Arizona.

Dozens of conference presentations and invitations provide extensive national and international recognition of Beto’s work. He testified twice in Congressional hearings, which ultimately led to the adoption of the Bilingual Education Act; was deeply involved in the initial planning stages of Pima Community College, where his powers of persuasion led to the college’s “open door” philosophy through which Spanish-speakers were welcomed into a rigorous bilingual education program; and with collaborator Hank Oyama, he established a literacy program for Mexican American inmates at the Arizona state prison in Florence.

Beto’s achievements have received recognition from the National Education Association, the US Commission on Civil Rights, the Mexican American Unity Council, and the National Association for Bilingual Education. In 1986 UArizona’s Office of Minority Student Affairs named him outstanding faculty contributor to minority student education. The Ana & Adalberto Student Center, the UA student center that provides spaces for minority students to gather, learn, and create community, is a lasting testimony to his tireless advocacy and contributions to student education.

Our Heads and Directors, voting on behalf of the general faculty as per SBS custom, have voted in favor of this nomination.
Adalberto M. Guerrero
6333 E Calle Mercurio
Tucson, Arizona 85710
Home - (520) 747-2220
Cell - (520) 780-8304
Email: aguerrero13@cox.net

Education

BA Spanish
University of Arizona 1957
Completed required course work for Ph.D. in Spanish literature in 1968 but because of time demands and involvement in numerous National educational commitments failed to finalize requirements.

About Professor Guerrero

Professor Guerrero has spent his life in service to his community and his students as an instructor of Spanish at Pueblo High School, as a lecturer in the Romance Languages Department (later Department of Spanish and Portuguese), as an Administrator at the University of Arizona, as a member of the planning staff for Pima Community College, and as an activist who changed the education of language minority students throughout the country.

Shortly after his arrival at the University of Arizona, Professor Guerrero became a nationally recognized leader in the fight for education and civil rights.

He is widely recognized as a pioneer in efforts to extend the guarantee of an equitable education to all students of the United States, particularly those whose rich cultural heritage and languages have historically kept them on the margins of society.

Professor Guerrero started his distinguished career after receiving his undergraduate degree in Spanish from the University of Arizona in 1957.

Prior to becoming a full-time instructor at the University of Arizona in 1963, he taught Spanish beginning in 1958 at Pueblo High School in Tucson. While there, in 1959 Professor Guerrero developed and piloted a special program of Spanish for Native Speakers, the first such program in the country, which brought national recognition to the school in 1965 when the National Education Association and Parade Magazine chose Pueblo High School as a “Pace Maker School.” Subsequently, an NEA-Tucson Survey Team, to which Guerrero was named, was formed to identify other successful educational programs in schools serving Spanish speaking students in California, Arizona, Colorado, New Mexico, and Texas. A follow up NEA Symposium, The Spanish Speaking Child in the Schools of the Southwest was held in Tucson in October 1966, in which Guerrero played a leading role.

Senator Ralph Yarborough and other influential senators and congressmen attended the Symposium and upon their return to Washington D.C. initiated legislation which would become ESEA, Title VII, The Bilingual Education Act. Hearings were held in California, Colorado, Texas and in Washington D.C. Professor Guerrero was asked to testify in Washington D.C. on behalf of the National Education Association before a Special Subcommittee on Bilingual Education of the United States Senate Committee on Labor and Welfare in support of Senate Bill 428, which resulted in Title VII, the Bilingual
Education Act. After identifying himself, Professor Guerrero addressed the Committee in his native language, Spanish. After a pause, he pointed out that the confusion and consternation the Senators experienced is what the non-English speaking children feel as they initiate their education in a language they do not understand. Among those present, Senators Ralph Yarborough, Paul Fannin of Arizona, Robert Kennedy of Massachusetts, and George Murphy of California, all of whom played an important role in the passage of the Bilingual Education Act, have written about the pivotal role that Professor Guerrero played in that legislation. Congressman Morris Udall called him, “one of the most eloquent witnesses who appeared at the Senate Hearings on this Bilingual Education proposal.”

On page 51, Bilingual Education: Learning While Learning English, author Angel Noé González affirms: “Three persons who should never be forgotten and who should be associated with the Birth of Bilingual Education and for ensuring that limited and non-English speaking students are provided with equality in educational opportunities are:
Adalberto Guerrero, Educator, Tucson, Arizona
Monroe Sweetland, National Education Association
Honorable Ralph Yarborough, U.S. Senator, (TX)

We shall forever be grateful for your leadership and contributions.”

Professor Guerrero was asked to testify on behalf of the California Education Association in 1967 before the California Legislature in support of a bill that would repeal the State Constitution Clause that specified English as the only allowable language of instruction in California public schools. In 1973 he was again called to testify on behalf of the Congreso Nacional de Asuntos Colegiales before the United States Senate Education Committee hearings on Bilingual Education.

Professor Guerrero proposed and collaborated in 1965 with University of Arizona colleague Dr. Charles Olstad in offering an NDEA (National Defense Education Act) summer institute which provided Spanish teachers with training and guidance for the teaching of Spanish to Native Speakers of Spanish. In 1965, also, he was permitted to offer the first class of its type, nationally, at the university level: Spanish for Native Speakers of Spanish. As at Pueblo High School, it became an instant success. Programs of this type are now universal and are referred to as Heritage Language Learning.

In 1969, the Board of Directors of the future Pima Community College appointed a select core of educators to define the mission, the philosophy, the goals, the curricula, recruitment of educational and other personnel... a total plan for its development! Professor Guerrero was asked to be part of that group. Among his salient contributions was an innovative Bilingual Education program. Federal funds he obtained formed the basis for an ongoing Guadalajara summer bilingual training program for Pima Community College instructors as well as for teachers in the TUSD Bilingual Program. These funds provided, also, a basis for the initial development of the Bilingual Program at PCC.

Demand for his time as a speaker throughout the country increased dramatically. Professor Guerrero had returned to the University of Arizona in August 1970. In 1973, at the demand of Chicano students, the office of Assistant Dean of Students for Mexican American Students was created. Professor Guerrero was the first to serve in that capacity until 1975 when University of Arizona President John Schaefer named him Chairman of the Mexican American Studies Committee, which subsequently became the Department of Mexican American Studies.
In 1977, Professor Guerrero returned to full time teaching in his home department, now Department of Spanish and Portuguese, and with the Bilingual Education Program under the leadership of Dr. Macario Saldate in the College of Education. To fully prepare prospective bilingual education teachers, in 1973 he taught two indispensable, and demanding, upper division courses: “Spanish for the Prospective Bilingual Education Teacher,” and “Literatura Infantil en Español” (Children’s Literature in Spanish), “Literatura Infantil en Español” had never been taught systematically in any university in this country. Only the University of Texas, Austin and the University of San Francisco offered the course very infrequently. (Professor Guerrero had created the “Literatura Infantil en Español” class in 1969.) He taught the two courses regularly from 1973 until his retirement in 1994. Until that time, the University of Arizona was the only university in this country which offered the course regularly.

From 1969 to 1973 during weekends Professor Guerrero offered workshops in Children’s Literature in Spanish for public school teachers throughout Texas. He was part of a team of educators working under the auspices of The University of Texas, Austin, Center for Public School Ethnic Studies in efforts to improve Chicano student education.

Among other assignments and activities, during 1974-1975, Professor Guerrero Served as a member of the Arizona State Department Advisory Board for Bilingual Education in preparing legislation on bilingual education. In 1975 he participated In a U.S. State Department sponsored survey of educational trends involving bilingual education in Peru, Bolivia, and Paraguay. The following year served as consultant to the Ministry of Education of Paraguay in a project sponsored by the Organization of American States to measure the linguistic ability in Spanish and Guarani of Paraguay first grade school children. From 1968 to 1974, he was a member and participant of the Advisory Committee for the Mexican American Studies Project of the U.S. Commission on Civil Rights. Professor Guerrero was instrumental in preparing proposals for and in instituting the Bilingual Education Fellowship Program and the Bilingual Education Development Program at the University of Arizona.

**Awards & Recognition**

- 1970 National Education Association Human Rights Award
- 1975 U.S. Commission on Civil Rights Award for work done as an Advisory Board Member of the Mexican American Education
- 1985 at tribute for his contributions to the Hispanic Community by the Mexican American Unity Council
- 1986 Outstanding Faculty Contributor to Minority Student Education by the University of Arizona Office of Minority Student Affairs at its first Annual Award Ceremony
- 1990 Tribute by Transamerica Systems Inc. for work in education and in the community.
- 1990 Pioneer Award for Bilingual Education by the National Association for Bilingual Education at the 19th Annual Conference.
- 1991 Honored by having the Center for Chicano Studies named after him. It was almost totally through Mr. Salomon Baldenegro’s efforts that this became a reality.
- 2011 received the Reconocimiento Stéén, “por su destacada labor a favor del derecho a la educación de niños y niñas de familias migrantes internacionales mexicanas,” from the Secretaríad de Relaciones Exteriores and the Secretaría de Educación Pública at Los Pinos in Mexico. D. F.
• 2012 the Universidad de Sonora in Hermosillo created in Professor Guerrero’s name an award to honor entities or persons who distinguished themselves in the multifaceted fields of Border Studies and Endeavors.
• 2013 Ramón Santiago NABE Award in recognition of Professor Guerrero’s contributions to Bilingual Education
• 2014 Dedication of the Adalberto and Ana Guerrero Student Center

**Community Boards**

Professor Guerrero continues to be active in the Tucson Community.
• Board Member Chicano-Raza Research Department at the University of Arizona
• Board Member (Former) Raza Studies Program at Tucson Unified School District
• Board Member (Former) Luz Academy of Tucson

**Community Activism**

• Professor Guerrero continues as a valued advisor in matters dealing with extended equity of educational opportunity to language minority students. Was a founder of the former Luz Academy of Tucson, a premier college preparatory high school in Tucson, AZ.

**Notable Accomplishments**

• 1959 Professor Guerrero started a special program of Spanish for native speakers of Spanish at Pueblo High School. The success of the program contributed to the recognition of Pueblo High School as a “Pace Maker School” by the National Education Association and Parade Magazine in 1965. It served as a model that other public high schools throughout the country emulated.
• 1965 Initiated the Spanish for Native Speakers program at the University of Arizona, the first such university program in the country. Adopted by other institutions, it is now known as Heritage Language Learning.
• 1968 – 1969 With Lucrecia Brady from the Arizona State Employment Office, and other community activists, established a federally funded Service Education and Rehabilitation bilingual training program in the barrio (vicinity of 29th and 7th Ave.)
• 1973 – 1974 Member of the National Science Foundation ME³ (Minorities in Engineering, Education, Effort)
• 1974 Served as consultant to the College of Education at Fordham University, New York under a Federal Health Education and Welfare program designed to provide an equitable education for Spanish speaking students in the Bronx, New York public schools.
• Summer of 1975 participated in a U.S. State Department sponsored survey of educational trends involving bilingual education in Peru, Bolivia, and Paraguay.
• Summer 1976 Served as consultant to the Ministry of Education of Paraguay in a project, sponsored by the Organization of American States, to measure the linguistic ability in Spanish and Guarani of Paraguayan first grade school children.
• December 8-11, 1976, served as co-chairman and co-sponsored with the Society of Ethnic and Special Studies, of Southern Illinois University of Edwardsville, a conference on special Emerging Programs in Higher Education, held in Tucson, AZ
May 19, 1967, testified on behalf of the National Education Association before a Special Subcommittee on Bilingual Education of the United States Senate Committee on Labor and Public Welfare in support of Senate Bill 42B, which resulted in Title VII.

February 24, 1967, testified on behalf of the California Education Association before the California Legislature in support of the Bill which would repeal the State Constitution Clause which specified English as the only allowable language of instruction in all California schools.

April 1, 1967, Served as keynote speaker at Fresno State College Seminar and Conference on Education for Spanish speaking students.

April 1967, spoke at a conference on bilingual education in Yeshiva University, New York, New York.

April 25-26, 1968, presented paper titled, “Teaching Spanish to the Spanish Speaking,” at the National Conference on Educational opportunities for Mexican Americans held in Austin, Texas.

June 4, 1970, addressed PROJECT MAESTRO students at California State College, Los Angeles, California on the future of bilingual education in public schools.

1969 – 1970, Named to the core group of educators responsible for planning Pima Community College. Among his most notable contributions was adoption of his proposed Bilingual Education Program, which was subsequently emulated throughout the country, including El Paso Community College, Texas and Hostos Community College in the Bronx, New York.

December 1969 presented paper titled, “El uso del teatro en la enseñanza del español a los alumnos de habla hispana,” at the Annual Convention of the American Association of Teachers of Spanish and Portuguese, held in Chicago.


October 1973, Yavapai College, conducted a workshop for teachers and students on “Juegos y Canciones de Niños.”

October 31, 1973, testified on behalf of the Congreso Nacional de Asuntos Colegiales


May 9, 1975, participated in, “Symposium of Chicanos in Higher Education,” sponsored by EIS and the Ford Foundation, Los Angeles, California.

1974-1975, Member of the Arizona State Department Advisory Board for Bilingual Education, in preparing legislation on bilingual education.

November 1974 presented a workshop in “Literatura Infantil in the Bilingual Classroom” at the Bilingual Education Conference in Mexico City, Mexico.

May 15-18, 1974, served on the National Planning Committee of the Annual International Conference on Bilingual Bicultural Education, held in New York City, NY. And presented a workshop in Literatura Infantil en Español.

May 1976, assisted in planning and coordinating Congreso Nacional de Asuntos Colegiales – Overseas Liaison Committee sponsored Field Trip/Round Table World Conference on Bilingual Education held in Tucson, Arizona.

August 1977 was asked by the American Association of Teachers of Spanish and Portuguese to present two workshops on Literatura Infantil at their first annual conference held abroad, in Madrid, Spain. According to the President of the association, evaluations of the workshops were the most enthusiastic he had ever seen.
In August 1979 the Mexican Government hosted in Cocoyoc a weeklong gathering of the most prominent Spanish world authors and authorities on Literatura Infantil en Español. Carmen Bravo Villasante, the recognized eminence was among those present. I was honored to be included among legendary authors and researchers such as Jaime García Padrino from Spain, and authors such as Alga Marina from Cuba, Juan S. Garrido from Mexico.

Worked with Dr. Macario Saldate in preparing a proposal for a Bilingual Training Program at the University of Arizona. The program was eventually recognized as the best bilingual teacher training in the country.

1965 Co-chaired, with Dr. Maria Urquides, “The NEA survey on the Teaching of Spanish to the Spanish Speaking.” The results of the survey were published by NEA as “The Invisible Minority.” The release of the document in the summer of 1966 brought to national awareness, for the first time, the plight of the Spanish speaking minorities in schools of the United States. The subsequent NEA sponsored symposium, “The Spanish Speaking Child in the schools of the Southwest,” held in Tucson, October 30-31, 1966, resulted directly in the federal legislation known as Title VII, The Bilingual Education Act.” The National Education Association later awarded the Human Rights Award in 1970 for this work.

1968 – 1974 Served as Advisory Board Member on the U.S. Commission on Civil Rights Mexican American Education Study. A series of six published reports that provided an analysis of educational strategies for meeting the needs of the student population. The U.S. Commission on Civil Rights later awarded the Human Rights Award in 1975 for this work.

1973 – 1975 served as the first Assistant Dean of Students for Mexican American Affairs under Dean Robert Svob at the University of Arizona. These were critical years in the evolution of the University of Arizona attitude regarding its responsibility to minorities in general and the Spanish speaking in particular. The University of Arizona relations with segments of the Mexican American community were tense and often even hostile. As Assistant Dean of Students for Mexican American Affairs, Professor Guerrero worked to establish the foundations for what would later become the Office of Minority Affairs.

January 1975 – June 1977 at the request of University of Arizona President John Schaefer, served as Chairman of the Mexican American Studies Committee. He resigned in 1977 and continued his teaching career in his home department, now Department of Spanish and Portuguese.

1965 In addition to classes in Spanish for native speakers started in 1965 and continued throughout the years in the Department of Romance Languages at the University of Arizona, developed a course in, “Children’s Literature in Spanish,” and a course in, “Spanish for the Bilingual Classroom Teacher.” Both courses were in response to the needs of teachers in bilingual education Bilingual Education Training Program.


1959 – 1963 Worked with TEA International Relations Committee

August 27, 1965, Special speaker at Cochise County Annual Teachers Institute held at Bisbee High School, “Language and the Bilingual Student.”

1965 – 1966 Worked with TEA Committee on Professional Rights and Responsibilities


October 30-31, 1966, assisted in planning the NEA Symposium, “The Spanish Speaking Child in the Schools of the Southwest,” held in Tucson, Arizona. The Bilingual Education Act, Title VII was a direct result of this symposium.

Mr. Ibrahim Al-Asmakh was born on February 18, 1962 in the State of Qatar. He is President of Regency Group Holding, and has had an active role in promoting the State of Qatar’s tourism sector. From 2001-2003, Mr. Al-Asmakh served as Vice Chairman of the Qatar Tourism Agency. He has also represented Qatar at major international conferences and exhibitions related to tourism and other industries.

**EDUCATION**

1987: University of Arizona, Bachelor of Science, Finance and Business Administration

**PHILANTHROPY**

2010: Established Afif Charity (formerly known as Al-Asmakh Charity), dedicated to the economic transformation of societies within the Middle East and to advising and financial support of businesses in developing countries.

Since its inception, Afif Charity has supported hundreds of social and development programs to benefit impoverished and developing communities across 17 countries, including projects in the areas of Relief, Health and Wellness, Empowerment, Education, Religious Expression, Water Security, Food Security, Housing, and the needs of parentless Children.

**AWARDS AND RECOGNITION**

2012: named “Travel Personality of the Year” by the World Travel Awards

2007-2015: Regency Travel and Tours awarded “World Leading Travel Agency” and the “Middle East Leading Travel Agency” for eight consecutive years

2001-2003: Vice Chairman for the Qatar Tourism Agency

**THROUGH REGENCY GROUP HOLDING, OVERSIGHT OF THE FOLLOWING**

**Real Estate**

- Al-Asmakh Real Estate Development Company
- Regency Real Estate
- DTZ Company
- Al-Asmakh Facilities Management
- Regency Beverly Hills Real Estate
Arts
- Regency Arts – An initiative aimed at promoting and diffusing culture. Regency Art holds a yearly symposium to exhibit the paintings and sculptures of dozens of artists from Qatar and around the world.

Tourism, Hotels and Hospitality
- Regency Travel and Tours (37 branches in Qatar with plans to expand into the United Arab Emirates and Saudi Arabia)
- Regency Holidays
- Wyndham Grand Regency Hotel
- Movenpick West Bay Doha
- Ramada Encore Hotel
- Place Vendôme, a retail and hotel complex in Doha’s emergent Lusail City, built in collaboration with United Developers. Expected to open in early 2022.

Construction
- Al-Asmakh Contracting
- Regency Pools and Landscaping

Transportation
- Regency Fleets

Insurance
- Oman Insurance Company

Medical Services
- Chain International Medical Company, which owns Kulud Pharmacy chain with 27 branches

Other Industries
- Emirates Kitchens
- Regency Recruitment Solutions Company
- Regency Public Relations
- Regency Services
- Regency Gas
- Ghalia Media and Advertisement Qatar
Nomination for Mr. Ibrahim Al-Asmakh  
School of Middle Eastern and North African Studies  
College of Social and Behavioral Sciences

In recognition of his groundbreaking contributions to global development and philanthropy, the School of Middle Eastern and North African Studies and the College of SBS are pleased to nominate Mr. Ibrahim Al-Asmakh for a Doctor of Humane Letters. SBS’s Heads and Directors, voting on behalf of the general faculty per college custom, have also overwhelmingly affirmed his nomination.

Mr. Al-Asmakh graduated from the University of Arizona in 1987 with a BS in Finance and Business Administration. In 1993, he established Regency Travel and Tours (RTT). Through that position and his role as Chairman of the Board of Qatar’s General Authority for Tourism, Mr. Al-Asmakh has played an instrumental role in the development of Qatar’s tourism industry, opening the country to visitors from across the globe and fostering international connections. RTT’s eventual consolidation with Mr. Al-Asmakh’s real estate interests led to the creation of the Regency Group Holding (RGH), a collection of diverse companies acting in major economic sectors, including travel, retail development, and the arts. Today RGH has a workforce of more than 3,000 employees from 34 different countries.

Mr. Al-Asmakh is not only an entrepreneur; he is also a philanthropist through his foundation, Afif Charity. Formerly known as Al-Asmakh Charitable Foundation, Afif focuses on empowering people around the world through thoughtful and effective collaborations with local communities and in partnership with local and international institutions.

Afif realizes its values – humanitarianism, independence, professionalism and neutrality – through programs consistent with Qatar’s 2030 National Vision of sustainable development standards. In particular, Afif’s priorities are in skills training, economic empowerment, and sustainable livelihoods. Outside of Qatar, Afif has been involved in emergency response and poverty alleviation in many countries, including Mauritania, Benin, Chad, Sudan, Uganda, Kenya, Somalia, Yemen, Turkey, Syria, Lebanon, Palestine, Bhutan, and Myanmar. Its projects are tailored to the needs of each community. For example, Afif has supported the creation or improvement of over 200 wells in infrastructure-poor countries, enabling access to clean water for dozens of communities. Afif’s work occurs through mechanisms like its cooperative agreement with UNHCR (the UN Refugee Agency) to mobilize emergency relief in emerging crises, as well as through direct investments, from support of cancer research in the US to poverty alleviation in Qatar.

In a 2016 television interview, Mr. Al-Asmakh spoke fondly about his experiences here at the University of Arizona. (The video is available here; it is in Arabic, though the smile when he talks about UA­rizona – starting around 15:50 – needs no translation). In the interview, he shares that he picked UArizona because of its excellent reputation, and because relatives who attended before him spoke highly of their experiences. He goes on to say that he found our city very welcoming and full of kind people.

Mr. Al-Asmakh continues to define the future of the outward looking country of Qatar. He has been a leader in the economic transformation of Qatar and other countries in the Middle East – a world region with which UA­rizona has vibrant programs and myriad active alumni. For his extraordinary vision and his distinguished contributions to the people of the region and far beyond, we are pleased to submit this nomination. Thank you for your consideration.
Table of Contents

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# Application Summary

## Competition Details

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<td>Shane Burgess</td>
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<tr>
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<td>Honorary Degree Nomination for Ms. Louva Dahozy</td>
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<td>Shane</td>
</tr>
<tr>
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<td>Burgess</td>
</tr>
<tr>
<td><strong>Email Address:</strong></td>
<td><a href="mailto:sburgess@cals.arizona.edu">sburgess@cals.arizona.edu</a></td>
</tr>
<tr>
<td><strong>Phone Number:</strong></td>
<td>(520) 621-7621</td>
</tr>
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<td><strong>College:</strong></td>
<td>College of Agriculture and Life Sciences; Cooperative Extension System</td>
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## Application Details

### Proposal Title
Honorary Degree Nomination for Ms. Louva Dahozy

### Candidate Full Name
Louva Dahozy

### Recommended Degree
Doctor of Science
MEMORANDUM

DATE: December 2, 2021

TO: Liesl Folks, Senior Vice President for Academic Affairs and Provost

FROM: Shane C. Burgess, Vice President for the Division of Agriculture, Life and Veterinary Sciences, and Cooperative Extension and Charles-Sander Dean of the College of Agriculture and Life Sciences

CONCURRENCE: Edward C. Martin, Interim Director, University of Arizona Cooperative Extension

SUBJECT: Honorary Degree Nomination for Ms. Louva Dahozy

Honorary Doctorate Degree Nomination

Nominee: Ms. Louva Dahozy

Nominating Academic Unit: Faculty of the School of Nutritional Sciences and Wellness

Nominating Colleges: College of Agriculture and Life Sciences

Cooperative Extension System

I am delighted, on behalf of the faculty of the School of Nutritional Sciences and Wellness and then jointly by the faculty of the College of Agriculture and Life Sciences (CALS) and the faculty of the Cooperative Extension System (CES), to nominate Ms. Louva Dahozy for an honorary Doctor of Science degree for her exceptional and exemplary humanitarian achievements and distinguished service to the Navajo Nation, the University of Arizona, and the people of Arizona and the United States. Specifically, her innovation has advanced: food security for Diné women, children, and older adults; nutrition education generally; Indigenous language radio broadcasting to reach the most underserved families; nutritional analysis generally; and the use and awareness of traditional Navajo foods.

Despite disruptions to her elementary and secondary education, Louva Dahozy has been a lifelong learner. She continuously pursues opportunities to increase her knowledge and skills and then relentlessly applies her knowledge to improve others’ lives.
Ms. Dahozy joined Arizona’s CES as a community educator in 1958. Her farming experience and passion for the opportunities that youth leadership programs like CES 4-H offer helped successfully deliver a diverse plethora of CES programs to and for Indigenous communities.

While employed in an Office of Navajo Economic Opportunity needs assessment during the late 1960s, Louva Dahozy observed that federally subsidized food assistance programs were often going unused as Diné families were not experienced in preparing these non-traditional foods. In response, she procured federal funding for radio programs in the Diné language on healthy foods, nutrition, and the diverse knowledge and skills encompassed within home economics. In many rural Indigenous communities without electricity, the only access to mass communications in the home was a transistor radio. So, for ten years, she produced and recorded daily episodes of Navajo Homemakers Radio Education and ensured these programs were broadcast by eight separate Navajo community stations.

Ms. Dahozy also built nutrition programs for the Navajo Nation’s Office of Women and Children Program. She initiated the 1985 nutritional analysis of Navajo foods that led to recognition of the health benefits of these traditional foods and their adoption in Indian Health Service hospitals.

Over the course of a career that continues today, Louva Dahozy has used many varied methods to promote nutrition education and advance food security. Two creative works stand out, the 1969 Navajo Homemaker Cookbook and the 1977 Navajo Terminology of Food and Nutrition, early works illustrating Navajo foods and providing recipes for using commodity foods. Her nutrition expertise and intimate knowledge of Navajo culture led to many invitations to teach about Navajo culture and Indigenous foods at colleges and universities, including Dartmouth University, Duke University, the University of Kansas, and the University of New Mexico, along with The University of Arizona, Prescott College and Diné College in Arizona. Her work has been highlighted, and her knowledge has been shared in international and national film and television productions, such as The Fixers (2021), World Central Kitchen (2020), and Jamie Oliver’s Food Revolution (2013), which presented Ms. Dahozy cooking Navajo native foods.

Inspired by Louva Dahozy, today’s CES employees continue to achieve the same outcome: delivering transformative programs to families and communities where they are most needed using current and relevant technology, pedagogical innovation, and communication skills.

Louva Dahozy’s sense of civic responsibility has extended beyond her commitment to nutrition education to other issues, including advocacy of voter’s rights, voter registration, and the needs of women and older adults in Indigenous communities across the United States. Her commitment to her community is evident through the following contributions:

- Founder and Ex-Officio Member, National Indian Council on Aging
- Founder and Ex-Officio Member, Navajo Nation Council on Aging
- Representative, White House Conference on Nutrition
- Representative, White House Conference on Aging
- Founder and Charter Member, North American Indian Women’s Association
In 1994 our then-College of Agriculture honored Louva Dahozy with a Lifetime Achievement Award. In 2016, she was also honored by the Apache County Recorder, Apache County Board of Supervisors, and the Navajo Nation Council.

I believe Louva Dahozy’s achievements are most richly deserving of recognition by our university with an honorary doctoral degree.

This nomination is supported by unanimous votes by both the CALS faculty and the CES faculty.

Biosketch

Louva Dahozy is a legendary leader, Diné knowledge holder, health educator, cultural teacher, and voter rights activist born in the 1920s on the Navajo Nation. Louva’s 70-year career of community advocacy began when she met the University of Arizona (UArizona) College of Agriculture and Life Sciences (CALS) Cooperative Extension (CE) faculty while farming 360 acres on the Colorado River Indian Tribes Nation. Along with their children, the Dahozy family grew many crops and animals. In the 1950s, UArizona recognized Louva’s keen talent in farming, youth, and 4-H and invited Louva to attend Extension trainings to become a community educator. UArizona CE enlisted Louva to promote extension programs in farming, crop health and economics, 4-H, nutrition, livestock, and home gardening. While conducting a needs assessment, Louva noted Diné elders lacked vital USDA commodity foods services and established the Navajo Homemakers Radio Education Program. As a visionary leader with a deep heart for her people, Louva spoke in the Diné language on healthy foods, nutrition, and home economics to improve people’s lives. Many Diné lived remotely in traditional dwellings with no electricity or piped water. Louva recorded her programs on 5-inch reel-to-reel tapes and mailed them to the UArizona for duplication. She received written letters from children saying, “because of your radio program, I had a birthday cake for the first time that my family learned to bake on through your radio program.” On her 95th birthday, radio announcer Navajo Bob teared up recalling his childhood and his mother rounding up the children to go into the hoghan to listen to Louva’s radio program. Louva built inaugural programs for Women, Infant, Children and served as a cultural mentor for Miss Navajo Nation. She assisted in the nutrition analysis of Navajo foods that resulted in the serving of blue corn mush in hospitals. For over 7 decades, Louva willingly offered her knowledge and expertise and contributed to many publications and videos on home life, nutrition education, and civic responsibility. One of her notable creative works includes the 1969 Navajo Homemaker Cookbook. Major universities, colleges, K-12 schools and various tribal programs sought out Louva for her expertise. Louva received numerous awards recognizing her lifelong work with the Navajo Nation, counties and states. Louva’s philosophy has been, “Having two cultures is better than one, so learn other cultures and use the best of that culture’s teaching to make your life better.” Louva recognized the best of the UArizona Extension and used that knowledge and skills to teach the Navajo people how to improve their lives. As a devoted civic leader, Louva extended her advocacy to voter’s rights leading a campaign to elect the first set of Apache County Supervisors in history for which she was later recognized in 2016 as A Living Treasure by the Apache County Recorder and the Board of Supervisors. Even at 96, Louva continues her life work, to encourage women and to communicate her messages to people of all ages in all walks of life.
LOUVA DAHOZY

Curriculum Vitae

Citizen of the Navajo Nation
96 year-old legendary leader, advocate, educator, and activist
P.O. Box 1304
Fort Defiance, AZ 86504, The Navajo Nation
(505) 870-1966
katherinearviso24@yahoo.com
https://www.youtube.com/watch?v=LyB6Tai6qiY

I. Chronology of Education
1958-1988 University of Arizona, College of Agriculture, Extension Services, Tucson, AZ. (Summer Sessions)

1940-1944 Tuba City High School, Tuba City, AZ. (General Studies) School closed due to war. All teachers & community members were assisting with the WWII wartime effort.

1933-1940 Leupp Boarding School, Leupp, AZ. (Elementary) School closed due to war. School facilities were used as a “wartime concentration camp” for American Japanese.

II. Chronology of Employment
2010-2016 Direct Care Worker, It’s A New Day Home Health Care, Inc., Arizona Long Term Care Services, Fort Defiance, AZ. Home-base care aide services are intended to enhance the capacity of consumers to attain or maintain consumers health and independence. As a Direct Care Worker, Louva took care of Wilson, her husband (8 hours @ 5 days per week).

1975-2000 Entrepreneur, Owner, Dahozy Tailer Park, Fort Defiance, AZ. Wilson & Louva Dahozy owned and operated a trailer park of 50 spaces for the community and employees of the Navajo Nation for 25 years.

1975-2000 Entrepreneur, Owner, Navajo Indian Arts and Crafts, Fort Defiance, AZ. As a talented artisan, Louva designed and sold her arts and craft at conferences throughout the United States, highlighting two annual sale tours to Hawaii.

1975-2000 Professional Beauty Consultant, Mary Kay Cosmetics Inc., Fort Defiance, AZ. As a beauty consultant, Louva emphasized the beauty of women featuring their inner-beauty through make-up products for professional business.
1975-1994 **Consultant & Educator, Consulting Service**, Fort Defiance, AZ. Provided instruction on Navajo Culture, Navajo Native Foods and home life for the University Native American students. Louva taught at the following universities upon request of Navajo and Native American students: University of Arizona, Tucson, AZ.; Prescott College, Prescott, AZ.; University of New Mexico, Albuquerque, NM; Navajo Community College, Tsaile, AZ.; Dartmouth University, Hanover, NH; Duke University, Durham, NC; University of Kansas, Lawrence, Kansas. On the Navajo Nation, Louva also presented to several programs: Navajo Division of Health, Navajo Division of Social Services, Public Schools, Bureau of Indian Affairs Boarding Schools, Navajo Head Start and Private Schools.

1986-1989 **Executive Director**, Office of Women & Children Program, Office of Miss Navajo Nation & Office of Navajo Nation Band, Executive Administration, Navajo Nation, Window Rock, Arizona. Served as director of the three programs simultaneously: to improve home life and provided professional guidance for women and children on Navajo Nation; provided valued teaching in the role of young women with the newly selected Miss Navajo Nation; assisted the Navajo Nation Band with program operations.

1978-1979 **Agency Supervisor**, Low Income Energy Assistance Program, Navajo Division of Social Services, Window Rock, AZ. The program provided coal and wood to families for warmth in the winter and renovated homes for safety compliance.

1968-1978 **Radio Program Coordinator, Announcer & Educator**, Emergency Food and Medical Services, Office of Navajo Economic Opportunity, Fort Defiance, AZ. Coordinated and recorded information and education on food and nutrition, infants and children health care, life care educational tools for parents and other information to improve the life of the Navajo people. Provided daily radio recording on a 5-inch reel to reel tapes and sent to University of Arizona, College of Agriculture, Cooperative Extension Services, Tucson, Arizona, for duplication. The tapes were sent from the Extension Services to the seven radio stations surrounding the Navajo Nation located in Gallup, NM; Farmington, NM; Blanding, Ut; Page, AZ; Flagstaff, AZ; Holbrook, AZ, & Ramah, NM. The educational program was designed for families in rural areas as most of the population had no access to electricity and water. The only available communication was the transistor radio. To date, hundreds of homes are still without electricity and water.

1965-1968 **Community Worker**, Local Community Development Program, ONEO, Fort Defiance, AZ. Made visitation to homes and collected needs assessment survey and provided recommendation for improvements of housing. While collecting information for assistance to families, Louva realized that the families required more education to effectively use the
USDA Commodity Foods to improve their families’ health and nutrition. A proposal to address this concern was written and soon thereafter, funds were approved directly from Washington, DC. As a result, the Navajo Homemakers Radio Education was born.

1963-1965 Radio Announcer, KGAK Radio Station, Gallup, NM. As a radio announcer, Louva provided daily information in the Navajo language on community activities and educational programs to improve the lives of the Navajo people.

1948-1962 Entrepreneur, Farmer, & Owner, Dahozys Irrigation Farm, Parker, AZ. Wilson and Louva Dahozys co-partnered and managed 360 acres of farmland. Planted and raised alfalfa, cotton, Malo maze, barley, watermelon, and cantaloupe year-round. They also planted a vegetable garden, raised chickens, turkeys, ducks, pigs, a dairy cow, and horses. The University of Arizona, Extension Service and the Bureau of Indian Affairs, Branch of Land Operation provided farming expertise and education to the farmers for improvements of crops which resulted in better prices. This partnership with the University continued with the Dahozys and their families for many years. When the Dahozys returned to Fort Defiance, AZ., Navajo Nation, they shared the knowledge and information with the Navajo Nation such as: 4-H youth program, radio nutrition education program, livestock improvement, home gardening, and many other similar programs of the University of Arizona Extension Services. Louva’s philosophy has always been, “Having two cultures is better than one, so, learn other cultures and use the best of that culture’s teaching, to make your life better.” Louva Dahozys recognized the best of the Extension Services and used that knowledge and skills to teach the Navajo people how to improve their lives.

III. Honors and Awards (4)
1. 2016 Outstanding Service and Contribution, The 23rd Navajo Nation Council honored & recognized Louva Dahozys for Outstanding Service and Contribution to the Navajo Nation, July 18, 2016, Window Rock, AZ.
2. 2016 A Living Treasure, Apache County Recorder and the Board of Supervisors honored Louva Dahozys for 50 years of service and Long-Time Voter Registration Advocate, June 16, 2016, St. Johns, AZ.
3. 1996 Grand Marshall, Navajo Nation Fair, Wilson & Louva Dahozys Grand Marshall for 50th Anniversary of the Navajo Nation Fair, Sept. 7, 1996, Window Rock, AZ. They were also celebrating their 50th wedding anniversary.
4. 1994 Lifetime Achievement Award, University of Arizona, College of Agriculture, Extension Services, March 4, 1994, Tucson, AZ.

IV. Service/Outreach (10)
1. 2012 Founder & Member, The Master Ranch Ministry, Non-denominational Church, Fort Defiance, AZ
2. 1994 Member, International Women’s Association, Washington, DC
3. 1994 Member, First Baptist Church, Window Rock, AZ
4. 1976 Founder & Ex-Officio Member, National Indian Council on Aging, Window Rock, AZ
5. 1976 Founder & Ex-Officio Member, Navajo Nation Council on Aging, Window Rock, AZ
7. 1971 Representative, White House Conference on Aging, Washington, DC
8. 1970 Founder & Charter Member, North American Indian Women’s Association NAIWA, Fort Collins, Colorado
9. 1970 Board Member, Board of Election Supervisor, Navajo Nation Election Office, Window Rock, AZ
10. 1958 Community Leader, 4-H Program, Cooperative Extension Services, College of Agriculture, University of Arizona, Parker, AZ (Yuma County) and Fort Defiance, AZ (Apache County)

V. Expert Interviews (12)
1. 2021 The Fixers, International Film Production, Filmed video education on Greenhouse building and the uses in educational system, Brentwood Communications, International, Inc. (BBII) and BYU Broadcasting, North Hills, CA
2. 2020 Louva Dahozey on Facebook & KTNN Navajo Radio Station, Educate & encourage the Navajo to observe all necessary steps to end Covid-19. Teaching from a mother and grandmother perspective in Fort Defiance, AZ
3. 2020 World Central Kitchen, International Film Crew, Video of Navajo Culture and Food & Nutrition Education, Boxes of food to Navajo people during Covid-19 pandemic months, Fort Defiance, AZ and Washington, DC
4. 2015 Educator-Broadcaster-Activist Louva Dahozey, 2015 Navajo Oral History Project, A Collaborative Project of Dine’ College, Tsaile, AZ and Winona State University, Winona, Minnesota
5. 2014 Native Elders Sharing Their Wisdom, 7th Generation Book that educated, inspired and empowered which was printed by Book Publishing Company, Summertown, TN
6. 2013 Jamie Oliver’s Food Revolution televise show documented Film with Louva Dahozey cooking Navajo Native Foods, Arizona Episode of Jamie’s America, Fort Defiance, AZ
7. 1994 How to Butcher a Sheep Video, Prescott College, Window Rock, AZ
8. 1988 Five Generation Navajo Family, Good Morning America, Joan London interviewed and documented the Navajo Nation, Window Rock, AZ
9. 1985 Use and Nutrient Composition of Traditional Navajo Foods, Navajo native foods were analyzed for nutrient value, Charles W. Weber, Department of Nutrition and Food Science, University of Arizona, Tucson, AZ and Wendy S. Wolfe, Division of Nutritional Sciences, Cornell University, Ithaca, New York & Katherine Dahozey Arviso, Navajo Nation Food and Nutrition Services, Window Rock, Arizona
10. 1945 *California of the Bliss*, Hollywood movie production down in a wagon train driven by Wilson & Louva Dahozzy, Oak Creek Canyon, Sedona, AZ

VI. **Creative works (2)**
1. 1977 *Navajo Terminology of Food and Nutrition*, Navajo Division of Health, Department of Food & Nutrition Services, Window Rock, AZ
2. 1969 *The Navajo Homemaker Cookbook*, in illustrated form, Navajo Food & Nutrition Program, Office of Navajo Economic Opportunity, Fort Defiance, AZ
Application Summary

Competition Details

**Competition Title:** 2022 Honorary Degrees Nominations  
**Award Cycle:** FY2022  
**Submission Deadline:** 12/3/2021 4:00 PM

Application Information

**Submitted By:** John Milbauer  
**Application ID:** 3636  
**Application Title:** Joe Tremaine Honorary Degree Nomination  
**Date Submitted:** 12/3/2021 11:06 AM

Personal Details

**Applicant First Name:** John  
**Applicant Last Name:** Milbauer  
**Email Address:** milbauer@email.arizona.edu  
**Phone Number:** (530) 520-4933  
**College:** College of Fine Arts

Application Details

**Proposal Title**  
Joe Tremaine Honorary Degree Nomination

**Candidate Full Name**  
Joe Tremaine

**Recommended Degree**  
Doctor of Fine Arts
December 3, 2021

Dear Honorary Degree Review Committee:

I fully support the nomination of choreographer and dance teacher Joe Tremaine for an Honorary Doctor of Fine Arts degree from the University of Arizona. This nomination originated in the School of Dance, was vetted by our College’s Honors & Awards Committee, and received strong faculty support in a vote of 54, with 53 supporting the nomination.

Mr. Tremaine has maintained an extraordinary career in an array of media from film, theatre, and television to videos, commercials, and nightclubs. The list of clients and collaborators with whom he has worked is a compendium of the greatest stage acts of the last half century: Debbie Reynolds, Liza Minnelli, Gene Kelly, Ed Sullivan, Carol Burnett, Cyd Charisse, Louis Armstrong, Jackie Gleason, Mary Tyler Moore, Kenny Rogers, Paula Abdul, Cameron Diaz, Christina Applegate, and dozens more.

The University of Arizona’s top-ranked School of Dance has benefitted tremendously from a thirty-year relationship with Mr. Tremaine. Since initial contact with Professor Michael Williams in 1992, Mr. Tremaine has been a featured guest artist at the Arizona Jazz Dance Showcase in alternate years, graciously offering his talent, experience, and wisdom to young dancers while refusing any fee. Additionally, he has been a crucial part of our recruitment efforts through his dance conventions that crisscross the country, educating and inspiring over 50,000 dancers annually. At both the Arizona Jazz Dance Showcases and his own conventions, Joe Tremaine has recommended our School of Dance enthusiastically; as a result, over half of our dance students have had contact with him prior to their arrival on campus.

The College of Fine Arts is excited to celebrate this thirty-year relationship with Joe Tremaine during the 2022 Commencement season. Mr. Tremaine’s presence on campus will engage a wide variety of campus and community stakeholders: his work is celebrated not only in Dance but also in the Fred Fox School of Music and the School of Theatre, Film & Television; he has worked in multiple genres that include musical theatre, jazz, country, and pop; and he would have tremendous intergenerational appeal as a collaborator with stars from Jackie Gleason to Paula Abdul.

Thank you for considering our nomination.

Sincerely,

Andrew Schulz
Vice President for the Arts
Dean, College of Fine Arts
Biographical sketch for Joe Tremaine, submitted by University of Arizona School of Dance faculty Chris Compton and Tammy Dyke-Compton, and reviewed/endorsed by the CFA Honors & Awards Committee, Associate Dean for Faculty Affairs John Milbauer, and Dean Andy Schulz.

Joe Tremaine has had an incredible impact on the world of jazz and commercial dance and has played a huge role in recruitment for the University of Arizona School of Dance for the past thirty years. More than half of our student body attended Joe Tremaine’s dance convention, had him as a teacher, assisted him with his convention, or were mentored by him in their dance training before attending the School of Dance. An ardent advocate for dance education, he has sent UArizona some of our most talented dancers, choreographers, and artists for three decades.

School of Dance Professor Michael Williams writes,

“We are forever grateful for Joe Tremaine’s support and loyalty to UA School of Dance. Back in the summer of 1992 when I had gotten the job to start the jazz area of UA Dance, I took Joe’s class at that Jazz Dance World Congress. I spoke to him, introducing myself & letting him know what I was about to embark on.

In the following summer, I called him, reminding him of me taking his class & explaining my role in jazz dance at UA. Thrilled, he said he remembered me. I asked him if he would consider coming to our Arizona Jazz Dance Showcase as a featured guest artist. He said I couldn’t afford him. I thanked him for speaking w/me and allowing my request. He said, “No, wait, I didn’t mean I wouldn’t do it.” SO, he accepted, starting that year, & every other year for the life of our event. No charge! Forever no fee for his contributions. Miraculously generous. He speaks highly of our program at his conventions where he is in contact with approximately 40,000 dancers and teachers per year, and we’ve had many outstanding students from his recommendations.”

Joe Tremaine’s career has made a permanent impact on jazz dance history. Mr. Tremaine is the recipient of five lifetime achievement awards, including the “Gus Giordano Lifetime Achievement Award” presented by Jazz Dance World Congress, Dance Masters of America’s “President’s Award,” and the “Outstanding Achievement in Dance Education” honor from the Bob Fosse Awards. He is referred to as the “architect of the commercial dance world” for having established the longest lasting dance convention, which has launched the careers of some of the most notable dancers of the past thirty-five years and is still going strong. The conventions visit twenty-five cities per year, educating over 50,000 dancers nationally.

In addition to being one of the most recognized and influential dance personalities in the country today, Mr. Tremaine is an internationally known dance educator, choreographer, and performer who has worked extensively on Broadway, with ballet companies, and in television, movies, videos, commercials, industrials, and nightclubs. His clients and collaborators include a half-century of luminaries such as Debbie Reynolds, Gene Kelly, Liza Minnelli, Louis Armstrong, Mary Tyler Moore, Ann Margret, Carol Burnett, Cameron Diaz, Ed Sullivan, Christina Applegate, Jerry Lewis, Kenny Rogers, Jackie Gleason, Goldie Hawn, Paula Abdul, and Cyd Charrise. He also serves on the boards of many dance-related organizations, including the American Dance Awards, and Professional Dancers Society, and is very active in philanthropic work.
JOE TREMAINE
President, Co-Founder

DANCE STYLES: JAZZ | CHARACTER WORK

Joe Tremaine started dancing when he was four years old, and hasn't stopped since. This charismatic, six foot tall man grew up in tiny Oak Ridge, Louisiana (population 250) and, until he was old enough to drive, his mother would take him to dance class three times a week in Monroe, 35 miles away.

Joe began teaching dance in high school and then furthered his passion in college. He earned a Bachelor's Degree in Psychology at Northeastern University of Louisiana and moved to New Orleans where he trained and performed at the New Orleans Ballet Association and New Orleans Opera. Joe then moved to New York City to pursue a career in theatre, where he swiftly landed dance and summer stock jobs.

He performed in Caterina Valente's European Shows, became a June Taylor Dancer on “The Jackie Gleason TV Show”, worked on the movie “Hello, Dolly,” performed in “Ed Sullivan Specials” and was asked to be the lead dancer on “The Jerry Lewis Show” at NBC Television in Burbank; a career move which brought him to Los Angeles, California, in 1967 and where he had a very successful career as a performer.

There he put together his own act called “Black, White and 14”. It opened a new room at Anaheim’s Grand Hotel, and on opening night, Las Vegas producers Line Renaud and Loulou Gaste helicoptered in, caught the performance and hired them on the spot to star in their new Las Vegas review “Flesh”. The show ran for a year at Caesar’s Palace and regularly sold out shows.

JOE TREMAINE DANCE CENTER & TREMAINE DANCE CONVENTIONS:

Joe opened his own studio in California in the 1970’s, “Joe Tremaine Dance Center”; the dance studio to the stars, where he had thousands of students pass through his door. After nearly 30 years, he stepped aside from the Dance Center in order to devote more time to the conventions and competitions. Tremaine Dance Conventions and Competitions was established 1981. President Joe Tremaine and his staff tour the country to about 25 cities every year bringing professional choreography/teaching to over 50,000 dancers nationwide.

CREDENTIALS

B.A. in Sociology – Northeastern Louisiana University – Monroe

Tremaine Dance Center – Owner & Teacher for over 23 years

University of California – Irvine & Riverside campuses

Arizona State University – Phoenix

University of Arizona – Tucson

Northeastern University – Boston

California State University – Long Beach

San Diego State University – San Diego

Board of Councillors of University of Southern California School of Theater

Former Vice President of the Professional Dancers Society of America

Co-Founder of the Professional Dancers Society’s Scholarship Program

Member of the National Academy of Television Arts and Sciences

Board of Advisors of the American Dance Awards

Board of Directors of the Professional Dancers Society
Board of Advisors of the Jazz Dance World Congress
Board of Advisors of Premiere Performing Arts in New York
among others...

AWARDS & HONORS RECEIVED
“Joe Tremaine Commercial Dance Scholarship” – Relativity School – Established 2014 – Ongoing
“Gene Kelly Legacy Award” – Dizzy Feet Foundation – 2015
“Outstanding Contributions to the World of Dance” – Career Transitions For Dancers – 2014
“Master Educator Award” – Carnival “Choreographer’s Ball” – 2014
“Lifetime Achievement Award” – Kids Artistic Review – 2013
“Lifetime Achievement Award” – Dance Studio Life Magazine – 2011
“Star Teacher” Legacy Award from Dancers Over 40 – 2011
Special Recognition from Louisiana Governor Bobby Jindal for his Contribution to the Arts – 2011
“President’s Award” – Dance Masters of America – 2011
“Man of the Year” – The Michael Awards – 2008
“Tremaine Dance Convention & Competition Days” Proclamation from NY Mayor Michael Bloomberg – 2007
“Lifetime Achievement Award” – Jazz Dance L.A. – 2002
“Lifetime Achievement Award” – Dance Under the Stars, Palm Springs, CA – 2001
  National Spokesman for National Dance Week – 2000
  Judge at the Miss Louisiana Pageant – 1999
  Judge at the Miss America Pageant – 1998
  “Joe Tremaine Day” – City of Shreveport, LA – 1998
  “Lifetime Achievement Award” – Retter Productions – 1998
  “Founders Award” – Friendship Through Dance – 1997
“Outstanding Achievement in Dance Education” – The Bob Fosse Awards – 1994
“Joe Tremaine Day” – State of Louisiana – 1993
  “Joe Tremaine Day” & “Key to the City” – City of Shreveport, LA – 1993
  “Key to the City” – Monroe, LA – 1993
  “Best Dance Instruction Video” – American Video Conference – 1988
  “Best Instructional Video in the World” – Billboard/MTV – 1988
  “Excellence in Jazz Dance” – Dance Educators of America – 1988
  “Gus Giordano Lifetime Achievement Award” – Jazz Dance World Congress – 1988
  …among others

Joe has choreographed for every medium in the entertainment industry including television, movies, videos, commercials, nightclub acts, industrials and concerts. His fast, funky and “very today” jazz is sometimes rock & roll, sometimes character, but always fun, exciting, entertaining, and useful. Internationally known choreographer, coach and teacher, Joe has worked with entertainers such as:

MALE ENTERTAINERS:
JACKIE GLEASON | JERRY LEWIS | ED SULLIVAN | GENE KELLY | MILTON BERLE | TOMMY TUNE | BOB HOPE | ART CARNEY | JACK BENNY | BOBBY DARRIN | BRUCE VILANCH | DOUG HENNING | RICHARD THOMAS | ALICE COOPER | SONNY BONO | HAL LINDEN | ALAN ALDA | HINTON BATTLE | JOHNATHAN WINTERS | ROBERT ALDA | KENNY ROGERS | SAL
Besides Joe's passion for dance, his foremost love and passion are his dogs... Axl (Wire Hair Fox Terrier), Boogie (aka - Boogie Woogie) (Curly Coated Retriever) and Zeke (1995-2006) (Curly Coated Retriever) who was truly Joe's soul mate.
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Hakim, Iman - #3643 - Honorary Degree for Amy Zuckerman

- A letter of nomination from the Dean
- Nominee's current curriculum vitae or resume

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Application Summary

Competition Details

Competition Title: 2022 Honorary Degrees Nominations
Award Cycle: FY2022
Submission Deadline: 12/3/2021 4:00 PM

Application Information

Submitted By: Lorraine Varela
Application ID: 3643
Application Title: Honorary Degree for Amy Zuckerman
Date Submitted: 12/3/2021 1:27 PM

Personal Details

Applicant First Name: Iman
Applicant Last Name: Hakim
Email Address: ihakim@arizona.edu
Phone Number: (520) 270-6680
College: Mel and Enid Zuckerman College of Public Health

Application Details

Proposal Title
Honorary Degree for Amy Zuckerman

Candidate Full Name
Amy B. Zuckerman

Recommended Degree
Doctor of Humane Letters
December 3, 2021

Liesl Folks, PhD, MBA  
Senior Vice President for Academic Affairs and Provost  
Administration 512

Dear Provost Folks:

I am delighted to write this letter in support of Amy Zuckerman’s nomination for an Honorary Doctor of Humane Letters Degree from the University of Arizona. She has a BFA in Photography from New York University and has her work displayed in many prominent museums and institutes. Ms. Zuckerman, along with her parents, Mel and Enid, always have been strong supporters of the University of Arizona, especially the Mel and Enid Zuckerman College of Public Health. The Zuckerman name is synonymous with health and wellness. Amy Zuckerman in particular has been a catalyst for social change around public health in our region and is well known for her work helping underserved communities.

Her long time support and advocacy of good health-supporting and elevating our students, faculty and researchers have helped tackle the public health issues of today and tomorrow. Over the past 20 years Amy has served on our Advisory Board, served as Co-Chair of our 10th and 20th Anniversary Galas and led the way for our student scholarship fundraising campaign.

As co-chair of the Zuckerman Family Foundation, she has helped steer and approve many grants to the Tucson community, including the Southern Arizona Community Food Bank and the YWCA to support the powerful voice of women; the University of Arizona and the College, specifically a matching donation where every dollar contributed to the Student Scholarship Endowment will be matched up to $2 million by the Zuckerman Family Foundation. In addition, the Zuckerman Family Foundation recently supported a new Bachelor of Arts (BA) degree in Wellness & Health Promotion Practice at the College. The new BA degree, inspired by the Zuckerman’s lifelong dedication to health and wellness, was created and implemented through the College to educate the next generation of wellness promoters and innovators.

Amy Zuckerman, as a champion for social justice, health and wellness and serving the underserved, is expanding our efforts to influence public health and creating healthier communities. She has worked with us in Southern Arizona on partnerships and transdisciplinary collaborations in a stakeholder-led approach that is building the best of public health.

Dr. Cyndi Thomson, Professor and Director of the Zuckerman Family Center for Prevention and Health Promotion, nominated Amy Zuckerman and said the following: “Ms. Zuckerman has shown strong and consistent commitment to our college, wellness programming and student education along with a commitment to wellness promotion across Southern Arizona. Her efforts have been instrumental to the growth and impact of the Zuckerman Family Center for Prevention and Health Promotion, which I have had the honor to direct over the past decade. Importantly, dozens of student undergraduate and graduate internships have been supported through these community-
centric wellness efforts. The compassion of Ms. Zuckerman to advance wellness is now translating into our 2022-2027 strategic plan which will include an expansion of wellness for older adults applying an intergenerational approach for program development and implementation.”

Amy Zuckerman is respected among our faculty and this nomination has garnered great support. Dr. Scott Carvajal, Interim Department Chair of Health Promotion Sciences said, “I support the nomination of Amy Zuckerman for the honorary degree. Her efforts have been instrumental to the growth and vibrancy of Health Promotion Sciences, particularly the Zuckerman Family Center—a hub of applied research and outreach at the UA. The support also was critical to the newly launched bachelor’s degree in Wellness and Health Promotion Practice—which promises to provide an important niche for higher education in the State and region, and provide a model for how to train the next generation in wellness education and service at the population level.” Another faculty member wrote, “I totally support this plan and honoring such an exemplar of public health!” This support for her nomination, including support from other department chairs, speaks volumes about her integrity, dedication and overall work.

By the example that she sets and the work that she has accomplished, Ms. Amy Zuckerman is an invaluable asset and inspiration to our students and faculty, the entire public health community in Arizona, and most importantly all of the residents of Arizona.

On behalf of the Mel and Enid Zuckerman College of Public Health, I enthusiastically support Ms. Amy Zuckerman’s nomination for an Honorary Doctor of Humane Letters Degree. Please let me know if you have any questions or need further information.

Sincerely,

Iman Hakim, MD, PhD, MPH
Dean and Professor
Mel and Enid Zuckerman Endowed Chair in Public Health
AMY ZUCKERMAN
ONE-PAGE BIO

Amy Zuckerman is a community advocate, photographer, and supporter of rural and public health. She has served in the Tucson community for many years on such boards as Group for Photographic Intentions, Center for Creative Photography, Office of Cultural Affairs, UA Presents, T.R.O.T., The Loft Theatre, and Tucson Values Teachers. She has been a recipient of the Arizona Commission and awarded a residency at the Yaddo Artist Colony. Amy's work is in permanent collections at the Arizona State Museum, Institute of Afro-American Affairs, National Museum of Kenya, New York Public Library, Schomburg Center for Research in Black Culture, Steele Memorial Children's Research Center, Smithsonian Institution, Tucson Museum of Art and the University of Arizona (main library). Her photography has been exhibited widely in both the U.S., Africa, and Mexico. She currently enjoys working on her 13-acre horse ranch and investing time and philanthropic work in the Tucson community.
EDUCATION:
New York University Bachelor of Fine Arts / Photography 1985

CURRENT INVOLVEMENTS
Cloudbase Ranch Horseboarding Facility: Manage 13 acre property and one employee. Board 21 horses and raise chickens. 1999 to Present

Zuckerman Community Outreach Foundation: Focus is education and health. 2008 to Present

Tucson Values Teachers: Founding Board Member 2008 to Present
2012: Development Director

Friends of Trauma/UMC: Founding Friend February 2011 to 2012

COMMUNITY INVOLVEMENT
Therapeutic Riding of Tucson Board Member 1999-2000
American Israel Friendship League Award Selection Committee 2000
Jewish Community Center Visual Arts Committee Chair 1998
Center for Creative Photography Board Member 1997 to 1998
Office of Cultural Office Affairs Advisory Board 1994 to 1998
Tucson / Pima Arts Council Grant Panelist 1993 & 1994
Tucson Community Foundation Grant Panelist 1993
Steele Memorial Children’s Research Center Art Committee 1992
Group for Photographic Intentions Board Member 1992 to 1998

PROGRAM DEVELOPMENT
University of Arizona: Trauma Department: Co-Chair of 1st Gala fund-raiser 2011 to Present
2012: Co-Chairing 2nd annual fund-raiser

Canyon Ranch Health Resorts: Art Consultant and Curator 1997 to Present
Developing and curating gallery sites of the visual arts.

Mel & Enid Zuckerman College of Public Health: 10 Year anniversary gala committee and fundraiser. Spring 2010

Group for Photographic Intentions: President / Fund-raiser 1993 to 1994
Second Annual Lecture Series. Created, developed and produced lecture series: “Praising the Spirit: A Native American Photography and Film Series”. Developed school workshops, publicity and audience development. Raised: $12,000.

Group for Photographic Intentions: Vice President / Fund-raiser 1992 to 1993
First Annual Lecture Series. Created, developed and produced lecture series: “Out of the Box: Non-Traditional Photography” & “Inside the Black Experience” Publicity, audience development and community support. Raised: $10,000.

Telluride International Film Festival: Assistant to Production Manager of Special Events. Research of products, acquisition arrangements, coordinate to develop and implement special events. 1989 to 1996
AMY B. ZUCKERMAN

Arizona Theater Company: Assistant to Events Coordinator 1990
Grand Opening at the Temple of Music and Art: Research of products and entertainment, acquisition arrangements and coordinator at event.

PHOTOGRAPHY IN PERMANENT COLLECTIONS

- Arizona State Museum, Tucson, AZ
- Institute of Afro-American Affairs, New York, NY
- National Museum of Kenya, Kenya, Africa
- New York Public Library, New York, NY
- Schomburg Center for Research in Black Culture, New York, NY
- Steele Memorial Children's Research Center, Tucson, AZ
- Smithsonian Institution, Washington, D.C.
- Tucson Museum of Art, Tucson, AZ
- University of Arizona (Main Library), Tucson, AZ

GRANTS

1995 Arizona Commission on the Arts: Traveling Exhibitions Program
1994 Arizona Commission on the Arts: Project Grant
1988 Residency at the Yaddo Artists Colony, Saratoga Springs, NY

BOOKS PUBLISHED

**Point of Fracture: Voices of Heinous Crime Survivors** — Amy Zuckerman / Karen Nysetedt

**Bellefontaine: A Historical Narrative** — Amy Zuckerman / Carole Owens

PUBLICATIONS

"Las Encinas" *Journal of the Southwest*, Volume 33, #2 Summer 1991
"Free to Open Landfills" *Village Voice* September 10, 1991
"Samburu of Loiyangalani" *World and I*, February 1990
"Utne Reader*, September/October 1990
"Inside the Squatters Movement" *Village Voice*, July 18, 1989
"Photographic Portfolio" *Ikon* (Ikon #10)
"The Land and the People of Kenya* "Harper and Row*, Inc. 1988
"Involving Us in Humanity: Four Women Photographers" *Downtown*, January 20, 1988
"Roy Ennis Stakes His Claim in Brooklyn" *City Sun*, July 2, 1986
"In Combat with Drought and Deserts* "United Nations Publishing*, 1986
"Out of Africa" "Village Voice*, December 1985
"Rebels, Models, and Sheep" *Zat*, 1984,
"Glen Branca" *East Village Eye*, 1984,

PHOTOGRAPHY EXHIBITIONS:

Widely exhibited in solo and group exhibitions in such places as New York City, Paris, Guadalajara & Ensenada Mexico; Nairobi, Kenya; Tulsa, Tucson and Phoenix as well as published reviews in each of these locations.
December 2, 2021

Honorary Degree Advisory Committee  
The University of Arizona

Dear Committee Members:

I am writing on behalf of the faculty of the College of Education to nominate Nancy C. Berge for an honorary Doctor of Humane Letters from the University of Arizona. The faculty in all four departments in the College of Education voted in support of this nomination.

Nancy Berge has long been committed to education. A graduate of our undergraduate elementary education program in 1958, Nancy while a student benefited from financial support from her great aunt, Nancy Lee Anderson. Because of that, Nancy realizes first-hand the importance of support for students, leading her to create a scholarship for students in the College of Education in the name of her great aunt and her family. Nancy was also a founding member of the College of Education National Advisory Board, serving from 1993-2005. She remains an Honorary Member of the Board.

As proud graduates of the University of Arizona, Nancy and her late husband Craig M. Berge and their family have contributed generously to support the people and programs at the University of Arizona. Through their philanthropy, the Berge Family has established the Nancy Lee and A. Anderson Scholarship in the College of Education, the Craig M. Berge Engineering Design Program, the Craig M. Berge College of Engineering Endowed Dean’s Chair, the Craig M. Berge Excellence in Mechanical Engineering Scholarship, and the Nancy C. and Craig M. Berge Endowed Chair for the Director of the UA Cancer Center.

The family also significantly contributed to the establish the Fayez K. Ghishan M.D. PANDA Endowed Directorship of the Steele Children’s Research Center at the College of Medicine-Tucson’s Department of Pediatrics. They have also provided generous philanthropic support to Arizona Athletics, College of Agriculture and Life Sciences, College of Medicine-Phoenix, College of Social and Behavioral Science, Honors College, Eller College of Management, Sarver Heart Center, University Libraries, UA Alumni Association, Mel and Enid Zuckerman College of Public Health, as well as general support to the University and its students.
Nancy's involvement with the university has gone far beyond financial support. Nancy has twice served on the University of Arizona Foundation Board of Trustees, from 2010 to 2016 and from 2019 to the present. She is the current Vice-Chair of the Board and is slated to become Board Chair in May 2022. Nancy is a current member of the Arizona Cancer Center Philanthropic Board, a founding and Golden member of the Phoenix Women’s Board of the Steele Children’s Research Center (PANDA), and a former member of the University of Arizona Foundation’s National Leadership Council, the University of Arizona’s Phoenix Biomedical Campus Advisory Council, and the Phoenix Friends of the University of Arizona Cancer Center Board.

Because of her unwavering support and dedication to education and to the University of Arizona, Nancy C. Berge is a fitting recipient of an honorary Doctor of Humane Letters, and the University of Arizona will be doing the right thing through this recognition.

Sincerely,

Bruce Johnson
Dean, College of Education
# Nancy Berge

## CONTACT INFORMATION:
Nancy Berge  
PO Box 4008  
Mesa, AZ 85211-4008  
(602) 370-1160

## EDUCATION:
| University of Arizona, BA in Education, 1958  
| Arizona State University, MA, 1960 |

## CAREER HISTORY:
Nancy Berge worked as a public-school teacher in Maricopa County until 1964.  
Nancy left teaching to raise her two daughters, Barbi and Charlene.  
The Berge family has been in the automobile business since 1944. Nancy’s late husband Craig Berge owned and managed Berge Ford located in Mesa, Arizona. Nancy took over managing Berge Ford when Craig Berge passed away in 2017. Nancy negotiated and completed the sale of Berge Ford in 2019 to Larry H. Miller dealerships.  
Since 2017, Nancy has been managing all of the other family business interests, which include agricultural, industrial and commercial real estate in Arizona and California.

## INTERESTS, VOLUNTEER SERVICE AND HOBBIES:
Nancy has been involved in a myriad of volunteer organizations in Arizona for many decades. In recent years, she has been an active volunteer and leader with Achievement Rewards for College Scientists, Mesa Educational Foundation, Mesa Symphony Guild, Desert Club of Mesa, and the Mesa Museum for Youth.  
Nancy is a devoted mother and grandmother. Her two daughters, Charlene and Barbi, have followed in her footsteps and are active volunteers in several Arizona charities and public service organizations. Nancy has five grandchildren including J.C. Flake, who is a national rodeo star and with whom Nancy travels to see compete as often as her schedule allows.

## UNIVERSITY OF ARIZONA AFFILIATIONS:
Nancy rejoined the University of Arizona Foundation Board of Trustees in 2019, after previously serving on the board from 2010 to 2016. She is the current Vice-Chair of the Board and is slated to become Board Chair in May 2022.  
Nancy is a current member of the Arizona Cancer Center Philanthropic Board.  
Nancy is an honorary member of the College of Education National Advisory Board.  
Nancy is a founding and Golden member of the Phoenix Women’s Board of the Steele Children’s Research Center (PANDA).
Nancy is a former member of the University of Arizona Foundation’s National Leadership Council, the University of Arizona’s Phoenix Biomedical Campus Advisory Council, and the Phoenix Friends of the University of Arizona Cancer Center Board.

Mrs. Berge’s late husband Craig Berge also served as a trustee of the University of Arizona Foundation. He was also an alumnus, having graduated from the University of Arizona in 1957 with a BS in Mechanical Engineering.

Mrs. Berge’s granddaughter Sterling Blum graduated from the University of Arizona in 2015 with a BA in Journalism.

Nancy Berge served as the University of Arizona Homecoming Queen in 1956.

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<th>UNIVERSITY PHILANTHROPIC SUPPORT:</th>
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<td>The Berge Family has contributed generously to support the people and programs at the University of Arizona.</td>
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Through their philanthropy the Berge Family has established the Nancy Lee and A. Anderson Scholarship in the College of Education, the Craig M. Berge Engineering Design Program, the Craig M. Berge College of Engineering Endowed Dean’s Chair, the Craig M. Berge Excellence in Mechanical Engineering Scholarship, and the Nancy C. and Craig M. Berge Endowed Chair for the Director of the UA Cancer Center.

The family also significantly contributed to the establish the Fayez K. Ghishan M.D. PANDA Endowed Directorship of the Steele Children’s Research Center at the College of Medicine-Tucson’s Department of Pediatrics. They have also provided generous philanthropic support to Arizona Athletics, CALS, College of Medicine-Phoenix, SBS, Honors, Eller, Sarver Heart Center, University Libraries, UA Alumni Association, Mel and Enid Zuckerman College of Public Health, as well as general support to the University and its students.
Nancy Berge is an advocate, educator and steadfast leader who promotes teaching, research and service across the state of Arizona. Nancy’s life is a testament to her strong support of education and health care in our state. Actively involved in student government, sorority life and the College of Education’s outstanding teacher organization at the University of Arizona, Nancy graduated in 1958 with a degree in education. After graduation from college, Nancy taught school in Maricopa County and earned her master’s degree at Arizona State University. Eventually, after marrying her college sweetheart, Craig M. Berge, Nancy retired from active teaching to raise her daughters and support several family businesses. Even after Nancy retired from the classroom, her passion for education and service to others never faded.

Sometimes the University of Arizona is more than just the backdrop for a love story. For the Berges, love for each other and for their alma mater was deep and lasting. After graduating and marrying, the couple became active volunteers and steadfast donors. Nancy and her family are lead benefactors to the University and their first endowed support was to the College of Education to create a scholarship in honor of her great aunt, Nancy Lee Anderson, and her family who helped send Nancy to college at the University of Arizona. The Berge Family has also contributed generously to the University of Arizona’s Cancer Center, College of Engineering and College of Medicine-Tucson’s Steele Children’s Research Center, as well as other programs at the University of Arizona and other state organizations.

Nancy is always eager to share the driving force behind the couple’s life-long commitment to the University, “We both feel the University of Arizona helped us to find the right direction for our futures, and our debt will never be paid in full.” Nancy loved being a teacher and is passionate about the University of Arizona’s premier role in both educating the next generation of Arizona students and their teachers. She also is dedicated to accelerating the pace of knowledge and innovation in health care to benefit the citizens of our state. A role model and relentless advocate, Nancy has served on many important University search committees and advisory boards. Committed to bettering the lives of children in Arizona, Nancy continues to be a driving force to increase support from others in support of education and children’s health.

The Berges have paid it forward both to the University of Arizona and many other civic and charitable organizations, all of which have all benefitted tremendously from the countless hours of public service Craig and Nancy devoted to better their Arizona community. They instilled this public service ethos in their daughters, who have held leadership roles in Arizona organizations focused on important issues involving water use and heart disease. Nancy shows no sign of “retiring” from her role leading her family’s businesses and charitable impacts and, for that, the University of Arizona and people of our state are extremely fortunate.
December 1, 2021

Dr. Bruce Johnson  
Dean and Professor  
Paul L. Lindsey & Kathy J. Alexander Chair  
College of Education  
University of Arizona

Dear Dean Johnson:

It is my privilege to write this letter of recommendation in support of Nancy C. Berge’s nomination for an honorary Doctor of Humane Letters. I can think of no other person who is more deserving of this recognition from the University of Arizona than Nancy Berge.

As many on the UA campus know, Nancy is an outstanding community leader and longtime supporter of the University of Arizona, having made numerous contributions to the campus during her lifetime. Her impact and philanthropy have been far-reaching, from the Steele Children’s Research Center and Sarver Heart Center to the Colleges of Education and Engineering. Nancy has not only been generous with her resources, but also gives countless hours of her time and talent to serve on various boards and committees across the University. In fact, she and her late husband, Craig, were engaged with the College of Engineering in various ways since they graduated from the University in 1958. Nancy’s decades of support are truly remarkable, and I view Nancy as both an advisor to the College and friend.

In 2019, Nancy committed a $20 million gift to establish the Craig M. Berge Endowed Dean’s Chair and the Craig M. Berge Engineering Design Program. With support from this transformational gift, the college is developing the curriculum for a four-year design program that will allow future generations of Wildcat Engineering students to graduate with robust hands-on experience. The program is a true differentiator for the College as we seek to grow our enrollment, with Nancy being a key part of the strategy around that donation.

Nancy’s history of philanthropy, exceptional volunteer leadership, and tireless dedication to creating a brighter future for all is extraordinary. From her wide range of philanthropic interests, it is abundantly evident that Nancy cares deeply about providing outstanding educational opportunities for Arizona students and about the health and well-being of Arizonans. For her many efforts and more than 6 decades of dedication to the success of the University of Arizona, we should be most proud to recognize Nancy with such an honor. She has my strongest support.

Sincerely,

David W. Hahn, PhD  
Craig M. Berge Dean, College of Engineering  
Professor and Eminent Scholar, Aerospace and Mechanical Engineering
October 22, 2021

Bruce Johnson, PhD  
Dean and Professor  
Paul L. Lindsey & Kathy J. Alexander Chair  
College of Education  
University of Arizona  
PO Box 210069  
Tucson, AZ 85721-0069

Dear Dr. Johnson:

It is my pleasure to provide this letter of recommendation in support of Nancy Berge’s nomination for an honorary Doctor of Humane Letters from the University of Arizona. Mrs. Berge, a 1958 University of Arizona Elementary Education degree graduate, is an outstanding role model for many. As community leaders, longtime supporters, and alumni of the University of Arizona, Mrs. Berge and her late husband, Craig, have been immensely invaluable to our work in advancing first-class cancer research and clinical care. She has supported the University of Arizona Cancer Center (UACC) for over 35 years, progressively increasing her support and serving on the Center’s advisory board, in addition to her committed service on the University of Arizona Foundation board of trustees. Her love for and confidence in the University and UACC is a true inspiration.

Mrs. Berge was a founding member of the Phoenix Friends in 1986, a support group for UACC. Their visionary mission was to assist cancer research by providing financial resources for clinical trials and seed funding. Each year, the Friends designated a specific project to raise funds for through its yearly gala fundraising event, An Evening with the Friends. Because of Phoenix Friends’ philanthropic support of high risk, high reward projects, many of these initiatives went on to be funded by federal agencies at a $1M plus level. Mrs. Berge served tirelessly in a variety of leadership roles throughout the entirety of the organization’s 34 of years existence. Though now disbanded, the Friends organization raised more than $6 million for UACC scientists in their search to discover better treatments and cures for cancer.

In 2019, Nancy committed to a $5 million transformational gift to establish the Nancy C. and Craig M. Berge Endowed Chair at the Cancer Center. Her incredible gift serves as a catalyst for lasting impact at the UACC by establishing an endowment that supports the director’s chair. Because of Nancy’s gift, the UACC is now poised to support top research priorities to lead significant innovative discoveries and state-of-the-art treatment, impacting patients at the local level, nationally and beyond. Nancy’s philanthropy, her partnership, guidance and volunteer leadership are helping to accelerate our Cancer Center’s progress, paving the way for life-changing and life-saving discoveries for countless people in Southern Arizona and beyond.

Nancy’s extraordinary philanthropy is a story of passionate resilience and exceptional volunteer leadership in advancing cancer research and care. She cares so deeply about providing outstanding educational opportunities for Arizona students and about the health and well-being of Arizonans. My
directorship bears the name of two very inspiring champions, a lasting tribute to Nancy and Craig's legacy that will create a brighter future for countless people. We are infinitely grateful to count Nancy as part of our team as we work together towards a future free from cancer.

Thank you for your consideration. I am happy to provide additional information if needed.

Best regards,

Joann B. Sweasy

Joann B. Sweasy, PhD
Director, The University of Arizona Cancer Center
Nancy C. and Craig M. Berge Endowed Chair
Professor, Cellular and Molecular Medicine
Professor, Radiation Oncology
October 19, 2021

Professor Bruce Johnson
Dean College of Education
1430 E. Second Street
P.O. Box 210069
Tucson, Arizona 85721

Dear Dean Johnson,

It gives me a great deal of pleasure to write this letter in support of conferring a University of Arizona Honorary PhD Degree on Nancy Berge. I have known Nancy since she joined the PANDA Women’s Board in 2000. PANDA (People Acting Know Discover Answers) is a major fund-raising group that supports Steele Children’s Research.

Nancy has close ties to UArizona as she is a graduate of the College of Education. She also received a master’s degree at Arizona State University. She attended UArizona with the financial support of an aunt/uncle who believed in Nancy and in education, and Nancy established a scholarship at the College in their memory. Nancy was active on campus, in Chi Omega sorority and was UArizona Homecoming Queen. Nancy and her late husband Craig have been loyal alumni. Craig served on the UA Foundation board for many years, and Nancy picked up the mantle in his memory and has been dedicated to our mission. She has been an active supporter and has made significant and transformational financial investments in our institution. Most personally for me and my department, she acted as a catalyst for the Ghishan-PANDA Endowed Directorship.

I truly believe that Nancy is most deserving of this high honor and would act as an ambassador and role model for our university. I can attest to the fact that she is a person of exemplary character, and we will be well served by having her join the ranks of our graduates with this advanced honorary degree.

Sincerely,

Fayez K. Ghishan, MD
PANDA Endowed Director, Steele Children’s Research Center
Chair, Department of Pediatrics
Physician-in-Chief, Banner Diamond Children’s Medical Center
Medical Director, Clinical and Translational Sciences Research Center
Horace W. Steele Endowed Chair in Pediatric Research
Alan and Janice Levin Family Endowed Professor in Pediatrics