EXECUTIVE SUMMARY

The STEM Education Innovation and Research Institute (SEIRI) was founded on June 1, 2016. We serve as the science, technology, engineering, and mathematics (STEM) education, innovation, research, evaluation, and consultation hub. SEIRI brings together expert education researchers with scientists and discipline-based education researchers in order to inform and reform undergraduate and graduate education across IUPUI’s campus and beyond. SEIRI functions as an independent campus unit administered by the Office of the Vice Chancellor for Research.

This report provides an overview of SEIRI’s accomplishments. SEIRI has had an exciting and productive two years under the direction of Founding Executive Director and Professor of Chemistry, Pratibha Varma-Nelson. SEIRI has quickly grown and now includes 10 full-time staff, several graduate and undergraduate researchers, and work-study students. Also, 10 IUPUI faculty have served on SEIRI’s advisory board.

SEIRI researchers have served or are currently serving on more than 20 funded grants. Most grants have been with the National Science Foundation. In addition, several projects are currently under review or in preparation for the upcoming fiscal year.

The inaugural SEIRI SEED Grant competition in 2017 yielded 12 submissions and SEIRI funded 7 projects with a total of $210,00. These recipients were recognized in a News at IUPUI press release titled, “IUPUI researchers to address complex educational challenges in STEM curricula.” The second SSG Competition yielded 8 submissions in May of 2018, 5 of which were awarded. SEIRI anticipates hosting another SSG competition in 2019.

SEIRI co-hosted five speakers, including (1) Ron Buckmire, NSF (2) Ann Austin, Michigan State University (3) Michael Ashby, University of Oklahoma (4) Erin Dolan, University of Georgia, and (5) Isiah Warner, Louisiana State University. In the upcoming year, SEIRI will host (1) Dr. Diane Bunce, Professor Emerita, Chemistry Education, The Catholic University of America, (2) a PLTL conference with PLTL-International Society (PLTLIS), and (3) a symposium for 2017 SSG recipients.

Finally, SEIRI researchers have produced 25 peer reviewed publications and have disseminated results at many conferences, both locally at IUPUI and nationally at STEM education venues, noted on page 16-17. SEIRI has also been recognized through various awards and has been noted in several press releases, as seen on pages 18-20.
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OUR VISION

To be a nationally and internationally recognized institute of excellence for STEM education, research and innovation, contributing to the advancement of STEM education across IUPUI, the nation, and the world.

OUR MISSION

To advance the state of the art of STEM education research and practice across IUPUI’s campus and beyond.

STRATEGIC GOALS

Innovation: Developing and promoting novel pedagogies to facilitate the competence and persistence of STEM learners from all backgrounds

Research: Investigating fundamental questions of how people learn STEM

Evaluation: Assessing the effectiveness of STEM faculty’s existing and proposed educational practices

Consultation: Supporting STEM faculty in participating in the scholarship of STEM teaching and learning in order to reform STEM curricula
Leadership Team
Pratibha Varma-Nelson, PhD, Founding Executive Director, Professor of Chemistry & Chemical Biology
Kim Nguyen, EdD, Director, Statewide & Regional Collaborations
Justin L. Hess, PhD, Assistant Director, Adjunct Assistant Faculty of STEM Education, Department of Technology Leadership and Communication

Research and Evaluation Team
John Buckwalter, MS, Research Associate, Woodrow Wilson Teaching Fellow, Career and Technology Education Workplace Specialist Instructor
Tony Chase, PhD, Educational Psychology, Evaluation & Research Specialist, Associate Faculty, Department of Chemistry & Chemical Biology
Deb Cole, Academic Specialist, Programming Associate
Anwesa Dasgupta, PhD, Postdoctoral Fellow
Grant A. Fore, MA, Research Associate; PhD Student, University of Cape Town
Michelle Quirke, Louis Stokes Alliances for Minority Participation, Project Manager
Brandon Sorge, PhD, Faculty Fellow, Assistant Professor of STEM Education Research, Department of Technology Leadership and Communication

Staff
Rylie Evans, Student Assistant, Media Arts and Sciences
Polly Maple, Director of Finance
Sheila Summers, Administrative Assistant
Pat Sung, Systems Analyst and Programmer

Graduate and Undergraduate Researchers
Felix Baum, Undergraduate Research Assistant, Pre-Med
Tyler Donaldson, Graduate Research Assistant, Applied Anthropology
Henry Hane, Graduate Research Assistant, Education
Gabby Kline, Undergraduate Research Assistant, Chemistry & Chemical Biology
Josh Matthews, Undergraduate Research Assistant, Pre-Med
Virginia Rhodes, Graduate Research Assistant, Psychology
Amber Rollings, Graduate Research Assistant, Applied Earth Sciences
Kunwar Singh, Undergraduate Research Assistant, Biology
William Wright, Undergraduate Research Assistant, Chemistry

2016-2018 Advisory Board
Jafari Ali, PhD, Professor of Computer Information Technology
Kathleen Marrs, PhD, Associate Professor, Biology Director
Razi Nalim, PhD, Executive Associate Dean for Research & Graduate Programs, Engineering
Tamiko Porter, PhD, Lecturer, Chemistry
Terri Tarr, PhD, Director of Center for Teaching and Learning
Jeffrey Watt, PhD, Professor and Interim Chair, Mathematical Sciences

2016-2017 Advisory Board
Paula Magee, PhD, Clinical Associate Professor, School of Education
Terri Talbert-Hatch, EdD, Associate Dean for Recruitment, Retention, & Student Services, Engineering
Erik Tillema, PhD, Associate Professor, Math Education, School of Education
Jane Williams, PhD, Associate Dean for Academic Affairs & Strategic Initiatives, School of Science
LEADERSHIP TEAM

PRATIBHA VARMA-NELSON: FOUNDING EXECUTIVE DIRECTOR
Pratibha Varma-Nelson is Professor of Chemistry and the founding executive director of SEIRI. Before she joined SEIRI she was the executive director of the Center for Teaching and Learning. She is well known in the STEM community for her pioneering work in the development, implementation and dissemination of the Peer-Led Team Learning (PLTL) model of teaching. She has been a Co-PI of three NSF funded National Dissemination Grants. In addition she was a founding Co-PI of the first NSF funded Undergraduate Research Center “Center for Authentic Science Practice in Education, (CASPiE)”. Her research group is currently working on the development, implementation, evaluation, and dissemination of cyber-PLTL (cPLTL). For the cPLTL project, she has received funding from IUPUI, NSF, and EDUCAUSE, Next Generation Learning Challenges. This work broadly informs the understanding of how students learn chemistry (general and organic) in online environments as well as in face-to-face environments. Dr. Varma-Nelson is co-author of several publications about PLTL, cPLTL, and CASPiE and has made numerous presentations in local, national, and international venues. She co-authored the 2011 AAAS report, “Vision and Change in Undergraduate Biology Education: A Call to Action” as well as several other national reports. Varma-Nelson received James Flack Norris Award (2008), Stanley C. Israel regional award from the American Chemical Society (2011), George C. Pimentel Award (2018). In 2017 she was selected as the ACS Fellow. She received her Ph.D. from the University of Illinois at Chicago and her B.Sc. from Pune University, India.

KIM NGUYEN: DIRECTOR FOR STATEWIDE AND REGIONAL COLLABORATIONS
Dr. Kim S. Nguyen is the Principal Investigator (PI) and Co-PI of several National Science Foundation (NSF) and National Institutes of Health (NIH) active awards. She was the founding director for operations and had served the Urban Center for the Advancement of STEM Education (UCASE) from 2006 through 2016. Dr. Nguyen was also appointed as Assistant Dean for Enrollment Management in the Purdue School of Science for 15 years. Her areas of expertise include student recruitment and retention, STEM educational outreach, collaborative partnership cultivation and project management. Dr. Nguyen has collaborated with faculty at a number of institutions in the state of Indiana and the Midwest, including University of Indianapolis, Ball State University, Chicago State University, University of Nebraska-Lincoln, Illinois State University, University of Missouri-St. Louis, Southern Illinois University-Edwardsville, and the Ohio State University to create regional networks of collaborators that promotes excellence in STEM teacher education and for broadening the participation of underrepresented minority groups in STEM disciplines. The Louis Stokes Midwest Center of Excellence (LSMCE) is an example of her work that is funded by the National Science Foundation since 2012.

JUSTIN L HESS: ASSISTANT DIRECTOR
Dr. Justin L Hess is the Assistant Director of SEIRI. In this role, Justin is working on improving the state of STEM education across IUPUI’s campus through collaborations with faculty within and beyond STEM. Dr. Hess is currently a Co-PI on several NSF active awards, including two Cultivating Cultures of Ethical STEM (CCE-STEM) awards and an Improving Undergraduate STEM (IUSE) Geopaths award. Dr. Hess’s research interests include exploring empathy’s functional role within engineering and design; designing STEM ethics curricula; and evaluating students’ learning in the spaces of design, ethics, and sustainability. Justin received his PhD from Purdue University’s School of Engineering Education, along with a Master of Science and Bachelor of Science in Civil Engineering. As a doctoral student, Justin was a National Science Foundation Graduate Research Fellow. Justin is currently the vice chair of the American Society of Civil Engineers’ Committee on Sustainability subcommittee on Formal Engineering Education and the Program Chair Elect for the American Society for Engineering Education Liberal Education/Engineering & Society Division.
JOHN BUCKWALTER: RESEARCH ASSOCIATE

John Buckwalter has come to SEIRI from the School of Engineering and Technology. John is also the Director of Induction Support for STEM educators in the IUPUI Woodrow Wilson program. John’s Undergraduate degree in Industrial Technology came from Ball State University and his Masters in Secondary Education and Administration and Supervision degrees was earned from Indiana University. John spent 28 years in K-12 education as a teacher, dean and building principal. John played a large role in a “turnaround” Middle school through curricular alignment and developing after school remediation programs. His research interests include, best practices in STEM education in urban schools, Social Science research as it relates to discouraged learners and STEM workforce education. Over the last two years John has worked in a consulting capacity with Indiana University P-16 center, Crane Naval Defense Base and Bloomfield high school in as curricular alignment to coordinate a multi-curricular thematic year long unit. John also helped in this same capacity at IUPUI on an National Science Foundation nanotechnology teacher education program. John also received his Mentor Training certificate from the Woodrow Wilson National Fellowship and The New Teacher Center Learning Zone.

ANTHONY CHASE: EVALUATION AND RESEARCH SPECIALIST

Dr. Chase is an Evaluation Specialist at SEIRI. His expertise is in Research Methodology and Assessment. He studied Chemical Education during his bachelor's program at the University of Nebraska as well as his master's program at Purdue University. His Ph.D. is in Educational Psychology and Research Methodology. His published work has been focused around chemistry laboratory assessment. He has worked closely with all three major military academies (United States Military Academy, United States Air Force Academy, and United States Naval Academy) to provide opportunities for cadets and midshipmen to engage in undergraduate research. Specifically, he stood up a Course-based Undergraduate Research Experience at the United States Military Academy at West Point that now impacts over a third of cadets entering the academy. His statistical expertise includes factor analyses, Multilevel Modeling, and Structural Equation Modeling.

DEB COLE: PROGRAMMING ASSOCIATE

Deb serves as academic specialist for the NSF-funded project, “Pilot Regional Louis Stokes Midwest Center of Excellence,” (lsmce.org) where she oversees the day-to-day administration of the project and develops and disseminates educational opportunities for higher-education STEM faculty, administrators, and underrepresented minorities. Deb brings more than twenty years of program and project management experience in a university and a non-profit setting. Her research and program experience began in 1995 while working on two behavioral NIH R01 grants at the IU School of Nursing on the IUPUI campus. Deb is currently a graduate student in Instructional Systems Technology (IST) at the Indiana University School of Education in Bloomington. Her area of academic and research interest is in the development of effective and adaptive online learning intervention models in STEM education, as well as, assessment and evaluation of educational interventions.
RESEARCH AND EVALUATION TEAM (CONTINUED)

ANNWESA DASGUPTA: POSTDOCTORAL FELLOW
Dr. Annwesa Dasgupta is a postdoctoral researcher with the STEM Education Innovation and Research Institute. Her primary role at SEIRI is to facilitate the SEIRI seed grant program (SSG) that serves as a grant competition for innovative pedagogical implementations by STEM faculty at IUPUI. Her research interests include biology education as well as integrated STEM research. In addition to overseeing the SSG program, she closely works with faculty on research-based implementation of CUREs (course based undergraduate research) as a model in the biology department. Dasgupta received her PhD in biology education research from Purdue University. Her dissertation was centered on the design of assessments that explore student difficulties in thinking about biology experiments. Previously, Dr. Dasgupta was a lecturer at Niagara University in Buffalo for undergraduate biology courses for majors and non-majors. She also gained some postdoctoral experiences with engineering education at Purdue University where she worked on the STEM+C project, which focused on enhancing STEM engagement and computational thinking (STEM+C) for K-2 grade students by developing connections across formal and informal learning environments.

GRANT FORE: RESEARCH ASSOCIATE
Grant Fore is a Research Associate in SEIRI. As a SEIRI staff member, Grant is involved in research development, qualitative and mixed methods research, and programmatic assessment and evaluation. His research interests include ethics and equity in STEM education, community-engaged pedagogy, the intersubjective experience of the instructor/student encounter, secondary STEM teacher professional development, and issues of power in STEM education discourse. He is also a doctoral candidate in the Anthropology Department at the University of Cape Town in South Africa, where he was previously awarded a Master’s degree. His dissertation research is focused on exploring the ethical becoming of architecture students within courses utilizing community-engaged pedagogies.

MICHELLE QUIRKE: IN LSAMP PROJECT MANAGER
Michelle Quirke, is a project manager for IN LSAMP, a project funded by the National Science Foundation under award HRD#1618-408. As project manager she assists campuses across Indiana in developing strategies to increase student participation in undergraduate research, and develop recruitment and retention models to increase the number of underrepresented minorities graduating with a STEM degree. She holds a Master of Science degree in Adult Continuing Education from IU. She has a wealth of experience at IUPUI working with research and grant management for federally funded programs in the areas of undergraduate research and training grants.

STAFF
SHEILA SUMMERS: ADMINISTRATIVE ASSISTANT
Sheila Summers joined SEIRI in August 2017 as an Administrative Assistant after working with the Division of Student Affairs for 2 years. Sheila helps coordinate programming efforts, such as invited speakers and workshops. Sheila also helps coordinate SEIRI marketing, such as the SEIRI newsletter. Sheila has professional training in dance and has taught ballet in a local dance studio for over 30 years.
### CURRENT GRADUATE STUDENTS

<table>
<thead>
<tr>
<th>Last Name(s)</th>
<th>Project/Grant</th>
<th>Hrs/Week</th>
<th>Scope of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Donaldson</td>
<td>NSF/IUSE</td>
<td>20</td>
<td>Data collection and analysis, curriculum design</td>
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<tr>
<td></td>
<td>(Geopaths)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hane</td>
<td>ITEST</td>
<td>20</td>
<td>Data collection, program implementation</td>
</tr>
<tr>
<td>Rhodes</td>
<td>cPLTL</td>
<td>10</td>
<td>Data collection, program implementation</td>
</tr>
<tr>
<td>Rollings</td>
<td>NSF/IUSE</td>
<td>20</td>
<td>Data collection, program implementation</td>
</tr>
<tr>
<td></td>
<td>(Butler)</td>
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### FORMER GRADUATE STUDENTS

<table>
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<tr>
<th>Last Name(s)</th>
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<th>Scope of Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ewing</td>
<td>RETAIN</td>
<td>10</td>
<td>Program coordination; Data Collection</td>
</tr>
<tr>
<td>Nunnaly</td>
<td>ITEST</td>
<td>20</td>
<td>Data collection, program implementation</td>
</tr>
<tr>
<td>Lakmala</td>
<td>PLTL</td>
<td>20</td>
<td>Data collection, program implementation</td>
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### CURRENT UNDERGRADUATE STUDENTS

<table>
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<th>Last Name(s)</th>
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<th>Hrs/Week</th>
<th>Scope of Work</th>
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<tbody>
<tr>
<td>Kline</td>
<td>CUREs</td>
<td>4</td>
<td>Data collection, analysis</td>
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<tr>
<td>Matthews</td>
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<td></td>
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<tr>
<td>Singh</td>
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<tr>
<td>Wright</td>
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### FORMER UNDERGRADUATE STUDENTS

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<thead>
<tr>
<th>Last Name(s)</th>
<th>Project/Grant</th>
<th>Hrs/Week</th>
<th>Scope of Work</th>
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</thead>
<tbody>
<tr>
<td>Scheive</td>
<td>Study Abroad</td>
<td>8</td>
<td>Data collection, program implementation</td>
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<tr>
<td>SPONSOR</td>
<td>PROPOSAL TITLE</td>
<td>PI</td>
<td>AMOUNT</td>
</tr>
<tr>
<td>--------------</td>
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<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>NSF/S-STEM</td>
<td>Empowering Informatics Diversity Enhanced Workforce</td>
<td>Palakal</td>
<td>4,041,077</td>
</tr>
<tr>
<td>NSF/LSAMP</td>
<td>Indiana STEM LSAMP</td>
<td>Paydar</td>
<td>1,787,421</td>
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<tr>
<td>NIH</td>
<td>IPREP: IUPUI Graduate Preparation for the Biomedical and Behavioral Sciences</td>
<td>Burr</td>
<td>1,583,188</td>
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<tr>
<td>LSMRCE</td>
<td>Collaborative Research: Louis Stokes Regional Center of Excellence: Broadening Participation in STEM</td>
<td>Nguyen</td>
<td>1,176,856</td>
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<tr>
<td>NSF/ITEST</td>
<td>Nanotechnology Experiences for Students and Teachers (NEST)</td>
<td>Agarwal</td>
<td>1,061,245</td>
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<tr>
<td>NSF/CCE STEM</td>
<td>Enhancing IUPUI STEM Curriculum through Community – Engaged Learning &amp; Ethical Reflection Framework (I-CELER)</td>
<td>Johnson</td>
<td>588,561</td>
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<tr>
<td>NSF/RET</td>
<td>Research Experiences for Teacher Advancement in Nanotechnology (RETAiN)</td>
<td>Rizkalla</td>
<td>494,220</td>
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<tr>
<td>NSF/NRT IGE</td>
<td>Promoting Creativity in Engineering/Technology Graduate Education through Integration of Arts/Design &amp; Experiential Learning</td>
<td>Anwar</td>
<td>452,958</td>
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<tr>
<td>NSF/IUSE</td>
<td>Building a New Generation of Urban Environmental Scholar – Citizens through Community-Based Programs for Science &amp; Impact</td>
<td>Filippelli</td>
<td>428,085</td>
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<td>NSF/REU</td>
<td>REU Site: Multidisciplinary Research for Undergraduates in Nanomaterials</td>
<td>Agarwal</td>
<td>359,848</td>
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<tr>
<td>NSF/REU</td>
<td>REU Site: Research Experience for Undergraduates in High Efficiency Computing</td>
<td>dos Santos</td>
<td>358,076</td>
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<tr>
<td>NSF/REU</td>
<td>REU Site: Data Science of Risk and Human Activity</td>
<td>Mohler</td>
<td>287,377</td>
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<tr>
<td>NSF/IUSE</td>
<td>Cultivating Scientific Literacy and Action through Place: Using a Campus Farm as an Interdisciplinary Learning Hub</td>
<td>Sorge (IUPUI)</td>
<td>95,346</td>
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<td>Angstmann (Butler)</td>
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<tr>
<td>NSF/Noyce</td>
<td>Midwest Regional Robert Noyce Connections, 2017, 2018, 2019</td>
<td>Nguyen (IUPUI)</td>
<td>44,014</td>
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<td></td>
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<td>Hunter (ISU)</td>
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<tr>
<td>Welcoming</td>
<td>Fostering Student Sense of Belonging and Community Engagement through Active Participation in STEM Organizations</td>
<td>Tovar</td>
<td>25,000</td>
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<tr>
<td>Campus/IUPUI</td>
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<tr>
<td>NSF/CCE STEM</td>
<td>Understanding and Evaluating Ethical Engineering</td>
<td>Hess (IUPUI)</td>
<td>23,835</td>
</tr>
<tr>
<td>(Purdue as Lead)</td>
<td></td>
<td>Brightman (Purdue)</td>
<td></td>
</tr>
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[https://seiri.iupui.edu/externalawards/index.html](https://seiri.iupui.edu/externalawards/index.html)
# GRANTS CURRENTLY UNDER REVIEW

<table>
<thead>
<tr>
<th>SPONSOR</th>
<th>TITLE</th>
<th>PI</th>
<th>AMOUNT</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSF/S-STEM</td>
<td>BioSTEM-IN: A Pathway of Biosciences Workforce Development for the Underrepresented and Minorities in Indiana</td>
<td>Purkayastha</td>
<td>3,666,942</td>
<td>9/15/2018-9/14/2023</td>
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<tr>
<td>NSF/S-STEM</td>
<td>Urban S-STEM Collaboratory</td>
<td>Russomano</td>
<td>1,701,277</td>
<td>6/1/2019-5/31-2024</td>
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<tr>
<td>NIH</td>
<td>BioMed IN: A P12-to-University Pathway of Biomedical Workforce Development for the Underrepresented and Minorities in Indiana</td>
<td>Purkayastha</td>
<td>1,299,644</td>
<td>4/1/2019-3/31/2024</td>
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<tr>
<td>NSF/CAREER</td>
<td>CAREER: Highly-sensitive Analytical Quantification using Electrochemiluminescence and Microfluidics</td>
<td>Deiss</td>
<td>626,324</td>
<td>7/1/2019-6/30/2024</td>
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<tr>
<td>NSF/REU</td>
<td>Analytical Chemistry Impacting Society (ACIS)</td>
<td>Goodpaster</td>
<td>369,886</td>
<td>1/1/2019-12/31/2021</td>
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<tr>
<td>NSF/REU</td>
<td>Multidisciplinary Research in Biological Signaling at IUPUI</td>
<td>Blacklock</td>
<td>364,551</td>
<td>9/1/2018-8/31/2021</td>
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<tr>
<td>NSF/REU</td>
<td>STEM Education Innovation and Research Institute Summer DBER Program</td>
<td>Varma-Nelson</td>
<td>358,171</td>
<td>1/1/2019-12/31/2022</td>
</tr>
</tbody>
</table>

# PREVIOUS GRANTS

<table>
<thead>
<tr>
<th>SPONSOR</th>
<th>PROPOSAL TITLE</th>
<th>PI</th>
<th>TOTAL AMOUNT</th>
<th>DATE</th>
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</thead>
<tbody>
<tr>
<td>ONR</td>
<td>STEM: 3D Visualizations of RF Signals in Electronic Warfare</td>
<td>Christopher</td>
<td>307,716</td>
<td>7/1/2016-6/30/2018</td>
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<tr>
<td>NIH</td>
<td>IPREP: IUPUI Graduate Preparation for the Biomedical and Behavioral</td>
<td>Burr</td>
<td>296,817</td>
<td>1/1/2017-12/31/2017</td>
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<tr>
<td>NSF</td>
<td>Pilot Regional Louis Stokes Center-Chicago</td>
<td>Nguyen</td>
<td>295,614</td>
<td>8/31/2013-7/31/2018</td>
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<tr>
<td>NSF/LSAMP</td>
<td>Louis Stokes Midwest Centers of Excellence Conference: Take Action</td>
<td>Nguyen</td>
<td>293,491</td>
<td>6/2/2017-7/31/2018</td>
</tr>
<tr>
<td>Indiana ACTE</td>
<td>Indiana CTE Teacher Recruitment, Training and Retention</td>
<td>Sorge</td>
<td>53,846</td>
<td>7/1/2015-6/30/2017</td>
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<td>Purdue University</td>
<td>Evaluation of the Indiana Science Initiative</td>
<td>Sorge</td>
<td>50,000</td>
<td>7/1/2016-10/30/2017</td>
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<tr>
<td>Purdue University</td>
<td>Indiana CTE Teacher Recruitment, Training and Retention</td>
<td>Sorge</td>
<td>36,465</td>
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## PROPOSALS SUBMITTED BUT NOT AWARDED

<table>
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<tr>
<th>SPONSOR</th>
<th>TITLE</th>
<th>PI</th>
<th>AMOUNT</th>
<th>DATE SUBMITTED</th>
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<tbody>
<tr>
<td>NSF/IUSE</td>
<td>Development of a Peer-Led Undergraduate Research Initiative (PLURI) Module in the Organic Chemistry Teaching Laboratory</td>
<td>Minto</td>
<td>300,000</td>
<td>04/07/17</td>
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<tr>
<td>NSF/NRT</td>
<td>NSF-INFEWS: Transformative Research and Education at the Nexus of Food, Energy, and Water (TREFEWS) in Urban-Rural Transition Zones</td>
<td>Basu</td>
<td>2,999,998</td>
<td>02/06/18</td>
</tr>
<tr>
<td>NIH/NIGMS</td>
<td>BioMedIN: A P12-to-University Pathway of Biomedical Workforce Development for the Underrepresented and Minorities in Indiana</td>
<td>Purkayastha</td>
<td>1,298,574</td>
<td>11/20/17</td>
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<td>HHMI</td>
<td>Inclusive Excellence: The Science Community of Transformation Initiative (SCoTI) at IUPUI</td>
<td>Johnson</td>
<td>1,000,000</td>
<td>10/10/17</td>
</tr>
<tr>
<td>NSF/REU</td>
<td>Multidisciplinary Research in Biological Signaling</td>
<td>Blacklock</td>
<td>364,551</td>
<td>08/23/17</td>
</tr>
<tr>
<td>NSF/REU</td>
<td>Analytical Chemistry Impacting Society</td>
<td>Goodpaster</td>
<td>313,429</td>
<td>08/23/17</td>
</tr>
<tr>
<td>NSF/IUSE</td>
<td>The Cyber STEM Challenge</td>
<td>Varma-Nelson</td>
<td>293,253</td>
<td>08/7/17</td>
</tr>
<tr>
<td>NSF/CAREER</td>
<td>CAREER: Three Dimensional Manufacturing of Tunable Nanocomposites</td>
<td>Ryu</td>
<td>500,000</td>
<td>07/20/17</td>
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<td>NSF/CAREER</td>
<td>CAREER: Dissecting the Role of Lysine Acetylation in Fine Tuning the Functions of DNA Polymerases</td>
<td>Balakrishnan</td>
<td>500,000</td>
<td>07/19/17</td>
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<td>INDIANA ACTE</td>
<td>Indiana CTE Teacher Recruitment, Training, and Retention</td>
<td>Buckwalter</td>
<td>441,346</td>
<td>06/30/17</td>
</tr>
<tr>
<td>IUPUI/McNair</td>
<td>IUPUI Ronald E. McNair Scholars Program=</td>
<td>Galli</td>
<td>1,132,997</td>
<td>04/07/17</td>
</tr>
<tr>
<td>NSF/STEM+C</td>
<td>GeoCT: Teaching Computational Thinking Through Middle School Geography</td>
<td>Miller</td>
<td>1,249,532</td>
<td>03/29/17</td>
</tr>
<tr>
<td>IUPUI/Welcome</td>
<td>Fostering Student Sense of Belonging and Community Engagement</td>
<td>Tovar</td>
<td>25,000</td>
<td>04/07/17</td>
</tr>
<tr>
<td>NSF/NRT</td>
<td>NSF-INFEWS: Integrated Training at the Nexus of Food, Water, and Energy to Improve the Quality of Life in Urban-Rural Transition Zones</td>
<td>Basu</td>
<td>2,999,637</td>
<td>02/07/17</td>
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<tr>
<td>NSF/NRT</td>
<td>Data Enabled Smart Biomechatronic Device and Instrumentation System Traineeship</td>
<td>Anwar</td>
<td>2,997,293</td>
<td>02/07/17</td>
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<tr>
<td>Spencer</td>
<td>Communal Learning for Broadening Participation in Computer Science</td>
<td>Mukhopadhyay</td>
<td>500,000</td>
<td>12/15/16</td>
</tr>
<tr>
<td>NSF/REU</td>
<td>Multidisciplinary Research in Biological Signaling</td>
<td>Blacklock</td>
<td>250,950</td>
<td>08/24/16</td>
</tr>
<tr>
<td>NSF/CAREER</td>
<td>Computational Methods for Uncovering the Structure and Dynamics of Protein-RNA Interaction Networks</td>
<td>Janga</td>
<td>500,000</td>
<td>07/20/16</td>
</tr>
<tr>
<td>NSF/CAREER</td>
<td>Molecular Evolution of Parasitism in Lucilia</td>
<td>Picard</td>
<td>500,000</td>
<td>7/20/16</td>
</tr>
</tbody>
</table>
The inaugural SEIRI Seed Grand Competition in 2017 yielded 12 submissions and funded 7 projects with a total of $210,000.

<table>
<thead>
<tr>
<th>PROJECTS AWARDED</th>
<th>INVESTIGATORS</th>
<th>LEAD DEPARTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing the Use and Effectiveness of Peer-Led Team Learning Workshops in Engineering</td>
<td>Eric Adams, PI Christine Krull Steven James Zachary Bart</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Engineering-Science Intellectual Property Project</td>
<td>Jie Chen, PI Hamid Piroozi Charles Feldhaus Xuan-Thao Ngoc Nguyen</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>Normalizing Computation in Undergraduate Physics Curriculum</td>
<td>Yogesh Joglekar, PI Gautam Vemuri</td>
<td>Physics</td>
</tr>
<tr>
<td>Integrated Learning for Undergraduate Students in Computer Information Technology</td>
<td>Xiao Luo, PI Connie Justice</td>
<td>Computer Information Technology</td>
</tr>
<tr>
<td>Research Based Implementation for CUREs in Biology</td>
<td>Kathleen Marrs, PI James Marrs</td>
<td>Biology</td>
</tr>
<tr>
<td>Improving Engagement in Online Education Using Guided Inquiry Learning in the Health Information Management Course</td>
<td>Saptarshi Purkayastha, PI Lisa DesNoyers Alisa Hayes</td>
<td>Informatics</td>
</tr>
<tr>
<td>Development of a Peer-Led Undergraduate Research Initiative (PLURI) Module in Organic Chemistry Teaching Laboratory</td>
<td>Robert Minto, PI Sèbastien Laulhè</td>
<td>Chemistry</td>
</tr>
</tbody>
</table>

https://seiri.iupui.edu/fundingopportunities/2017ssgprojects.html
The 2018 SEIRI Seed Grant Competition in 2018 yielded 8 submissions and funded 5 projects with a total of $137,000.

<table>
<thead>
<tr>
<th>PROJECTS AWARDED</th>
<th>INVESTIGATORS</th>
<th>LEAD DEPARTMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrating Disciplinary International Collaborative Experiences (DICE) into the Undergraduate STEM Curriculum</td>
<td>Rob Elliott, PI Leslie Bozeman</td>
<td>Computer and Information Technology</td>
</tr>
<tr>
<td>Extracurricular Projects to Enhance the Current Engineering Educational Paradigm</td>
<td>Alan Jones, PI</td>
<td>Mechanical and Energy Engineering</td>
</tr>
<tr>
<td>Peer Assistant Role Models in a Graduate Computer Science Course</td>
<td>Evava Pietri, PI Snehasis Mukhopadhyay Leslie Ashburn-Nardo</td>
<td>Psychology</td>
</tr>
<tr>
<td>Indianapolis Metropolitan Area Chemist Community Outreach Program (I M A Chemist Program)</td>
<td>Tamiko Porter, PI Eric Long</td>
<td>Chemistry &amp; Chemical Biology</td>
</tr>
<tr>
<td>Writing Support in STEM Education: Replication and Expansion of a Model to Improve Writing Support Tutor Training</td>
<td>Robert Weissbach, PI Corinne Renquette Mary Frances Baechle Matt Rothrock Ruth Pflueger John Meckley</td>
<td>Engineering Technology</td>
</tr>
</tbody>
</table>

https://seiri.iupui.edu/fundingopportunities/2018ssgprojects.html
INDIANAPOLIS -- Researchers in the science, technology, engineering and mathematics fields at Indiana University-Purdue University Indianapolis will address complex educational challenges in STEM curricula with financial support from a campus institute.

IUPUI's STEM Education Innovation and Research Institute (SEIRI), recently awarded seven projects a total of $10,000 in the inaugural round of the SEIRI Seed Grant program.

Jie Chen, professor and chair in the Department of Mechanical Engineering and director of the DOE Industrial Assessment Center in the Purdue School of Engineering and Technology, is the principal investigator for a project titled "Engineering-Science Intellectual Property Project." The goal is to provide IUPUI engineering students with a meaningful understanding about intellectual property, or IP.
Chen said the lack of IP knowledge among engineering students includes misunderstanding of what constitutes subject matter that can be protected, how to transform intellectual property that cannot be protected into something that can be and what results in he infringement of others' intellectual property.

"The ESIP-Project pilot program includes three elective courses that together initially create an IP concentration in an engineering B.S. curriculum at IUPUI. The long-term goal is creating an IP concentration in STEM curricula, with each course requiring a deep dive into IP concepts in STEM-related subject matter," said Hamid Piroozi <https://mckinneylaw.iu.edu/faculty-staff/profile.cfm?id=644>, co-principal investigator and instructor of the IP courses. "In each of these courses, students will prepare designs in accordance with a new pedagogical approach of teaching STEM-related concepts that uses IP as a starting point, which can generate a transformational shift in STEM education and provide career-long benefits."

Piroozi said intellectual property generated by IUPUI students will be owned by the students. The project will be a student-based activity, with potential collaboration with the Indiana University Robert H. McKinney School of Law Entrepreneurship Clinic.

"At the culmination of this pilot program, IUPUI students will be well-poised to take -- and pass -- the patent bar examination," Chen said. "Graduates will have new career options, including becoming patent engineers and patent agents, in addition to the traditional technical career choices, as well as a solid foundation for continuing to law school and other graduate programs."

Yogesh N. Joglekar <http://physics.iupui.edu/people/yogesh-joglekar>, associate professor in the Department of Physics in the School of Science, and Gautam Vemuri <http://physics.iupui.edu/people/gautam-vemuri-0>, professor in the Department of Physics, are co-principal investigators for a project titled "Normalizing Computation in Undergraduate Physics Curriculum." The goal is to instill within IUPUI students a computational mindset when studying physics.
Joglekar said many students think physics is only theoretical, with no consequences to the real world. They also find it difficult to develop intuition for things they cannot see, like electromagnetic waves and the behavior of quantum particles.

"The traditional physics curriculum is dominated by examples whose primary strength is that they can be solved analytically," he said. "Modeling real-life applications requires a computational component. With repeated usage, that component can also develop intuition in the case of more abstract concepts."

Joglekar said the project will include computational modules in every course of the physics curriculum at IUPUI. Traditionally students take one course, usually optional, in computational methods. He said MATLAB will be adopted as the primary software used in the courses.

"This project will benefit all IUPUI physics students -- undergraduate majors and graduate students alike. By deepening the connection between physics and the real world, we may be able to increase the number of students choosing a physics major," he said. "Further, our students will graduate with a set of skills that goes beyond what is typically offered in a physics department and that will greatly benefit them regardless of the career they choose."

Kathleen A. Marrs, associate professor in the Department of Biology in the School of Science, is the principal investigator for a project titled "Research-Based Implementation of CUREs in Biology." Professor James Marrs and research assistant professor Swapnalee Sarmah are also part of the project. The goal is to increase undergraduate participation in authentic research, which could increase student retention and encourage students to pursue graduate education or careers in science.
"IUPUI involves many students in traditional mentored undergraduate research, but it can be difficult to accommodate large numbers," Marrs said. "A recent successful strategy to increase student involvement in undergraduate research is accomplished through course based research experiences, or CUREs, in laboratory courses, where students work on authentic research questions related to faculty research interests. Due to the authentic nature of the research project, CUREs can produce novel results that are of broad interest to the scientific community."

Marrs said the project will encourage a departmental culture that is characterized by ongoing exploration, communication, and adoption of CUREs and other evidence-based instructional practices in biology labs. The department has already sent teams of faculty members to the National Academies Summer Institute for Undergraduate Education in Biology and the 2016 Partnership for Undergraduate Life Sciences Education conference.

"By asking IUPUI students to think about how to research compelling medical or societal challenges, our overall goal is to develop a unified departmental CURE model to address national goals to involve more undergraduates in authentic scientific research," she said.

"Ideally, each project will integrate the five dimensions of a CURE: broadly relevant and important work, use of scientific practices, collaboration, iteration in discovery research, and communication of scientific findings. In doing so, we expect to see significant gains in IUPUI students' ability to design experiments, analyze data and make scientific presentations, translating into high student satisfaction and enhanced learning."

Other principal investigators and projects that were awarded 2017 SEIRI Seed Grants are:

- Eric Adams <ht t p:/ / www.engr.iupui.edu/ main/ people/ detail.php?id=er wadams> , Department of Mechanical Engineering, School of Engineering and Technology, "Increasing the Use and Effectiveness of Peer-Led Team Learning Workshops in Engineering."

- Xiao Luo <ht tp:/ / engr.iupui.edu/ main/ people/ det ail.php?id =luo25> , Department of Computer Information Technology, School of Engineering and Technology, "Integrating Learning for Undergraduate Students in Computer Information Technology through Cross Curricular Instruction Units and Projects: 'Cross-Curricular I-UP.'"
• Robert Minto <http://chem.iupui.edu/people/robert-e-minto>, Department of Chemistry and Chemical Biology, School of Science, "Development of a Peer-Led Undergraduate Research Initiative (PLURI) Module in Organic Chemistry Teaching Laboratory."

• Saptarshi Purkayastha <https://soic.iupui.edu/people/saptarshi-purkayastha>, Department of BioHealth Informatics, School of Informatics and Computing, "Improving Engagement in Online Education Using Guided Inquiry Learning in the Health Information Management Courses."

Abstracts for all SSG projects awarded in 2017 <https://seiri.iupui.edu/ssg/index.html> can be found online.

Pratibha Varma-Nelson<http://chem.iupui.edu/people/pratibha-varma-nelson>, professor of chemistry and SEIRI founding executive director, said the grant program gives faculty the opportunity to address key issues within their curriculum.

"The grants provide faculty within STEM departments seed funding for education, innovation and research," she said. "They also will enable faculty to be more competitive to receive external funding, such as from the National Science Foundation or the National Institutes of Health."

Pratibha Varma-Nelson

Varma-Nelson said IUPUI researchers across all STEM disciplines submitted high-quality projects for the SEIRI Seed Grant program.

"My colleagues and I look forward to working with the principal investigators and other project personnel on each of the projects as they develop their ideas," she said.

The next grant solicitation will be in May 2018. As information about the upcoming solicitation becomes available, it will be posted on the SEIRI website. Questions should be sent to Varma Nelson at pvn@iupui.edu.

**Filed Under:** Bicentennial Priority: A Commitment to Student Success <https://news.iu.edu/tags/bicentennial-priority-a-commitment-to-student-success>, Bicentennial Priority: A Community of Scholars
SEIRI hosted 5 speakers since 2016 and is looking forward to hosting speakers in the future:

- Ron Buckmire, PhD, Lead Program Director for S-STEM at NSF, 10/27/2016
- Ann Austin, PhD, Associate Dean for Research, Michigan State University, 10/23/2017
- Michael Ashby, PhD, Department of Chemistry & Biochemistry, University of Oklahoma, 11/8/2017
- Erin Dolan, PhD, Professor of Biochemistry & Molecular Biology, University of Georgia, 11/17/2017
- Isiah Warner, PhD, Department of Chemistry, Louisiana State University, 3/28/2017
- Diane Bunce, PhD, Department of Chemistry, The Catholic University of America, Washington, DC, 10/24/2018
VISITORS TO SEIRI

The following table reflects the number of faculty and staff within IUPUI, as well as other universities, who have visited SEIRI for consultations, to learn about SEIRI, and to meet with faculty and staff. SEIRI has seen over 457 visitors in the past two years, representing 23 universities(235,470),(828,849) outside of IUPUI, IU Bloomington and IU East.

We have consulted with 18 different departments within the IU system, including STEM, the School of Law, School of Philosophy, the Center for Service and Learning, and the Lilly Family School of Philanthropy.

<table>
<thead>
<tr>
<th>University</th>
<th>Department</th>
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<tr>
<td>IUPUI</td>
<td>Engineering &amp; Technology</td>
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<td>Law</td>
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<td>Philosophy</td>
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<td>Center for Service &amp; Learning</td>
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<td>Center for Teaching &amp; Learning</td>
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<td>Lilly School of Philanthropy</td>
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<td>Education</td>
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<td>Informatics</td>
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<td>Public Health</td>
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<td>Psychology</td>
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<td>Nursing</td>
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<td>Library and Information Science</td>
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<td>School of Dentistry</td>
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<td>School of International Affairs</td>
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<tr>
<td>Michigan State University</td>
<td>Chemistry</td>
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<td>University of Oklahoma</td>
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<td>University of Georgia</td>
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<td>Louisiana State University</td>
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<td>The Catholic University of America, Washington, DC</td>
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<td>IU, Bloomington</td>
<td>Informatics, Chemistry</td>
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<tr>
<td>IU, East</td>
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<tr>
<td>NSF/Washington, DC</td>
<td>Mathematics</td>
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<tr>
<td>Butler University, Indianapolis, IN</td>
<td>Education</td>
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<td>University of Maryland</td>
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<td>University of Michigan</td>
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<tr>
<td>University of Texas-Arlington</td>
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<tr>
<td>University of Minnesota</td>
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<tr>
<td>Purdue University</td>
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<td>Stanford University</td>
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<tr>
<td>Harvard University</td>
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<td>Southern Methodist University</td>
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<tr>
<td>Duke University</td>
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<td>Sun Yat-Sen</td>
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<td>Rutgers</td>
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<td>University of Nebraska-Lincoln</td>
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<td>Missouri State</td>
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<td>University of Illinois/Champaign</td>
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<tr>
<td>The Ohio State</td>
<td>Chemistry</td>
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<tr>
<td>Ball State University</td>
<td>Chemistry</td>
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</tbody>
</table>
PUBLICATIONS


HONORS AND AWARDS

Pratibha Varma-Nelson
• 2018 ACS George Pimentel Award, 3/2018
• 2017 ACS Fellow, 6/19/2017
• NPR interview on PLTL, 2/19/2017

Kim Nguyen
• Certificates for serving as an executive board member by the Asian Pacific American Faculty and Staff Council, 4/2017 and 4/2018

Justin Hess
• Third Best Research Paper Award, ASEE’s Entrepreneurship & Engineering Innovation Division, June 2018
• Best Paper Award, ASEE’s Computing & Information Technology Division, June 2016
• Apprentice Faculty Grant, ASEE’s Engineering Research Methods Division, June 2016

Tony Chase
• Travel award from the American Chemical Society to attend the national meeting, 3/2018;
• Travel award from the American Chemical Society-Exams Institute to attend the Biennial Conference on Chemical Education, 7/2018

Deb Cole
• Travel award to participate in the CC BioINSITES workshop at HHMI in May, 2018

DJ Singh and William Wright
• Two students received travel awards form the IUPUI Center for Research and Learning to attend the Biennial Conference on Chemical Education, 7/2018
PRESS RELEASES

• Pratibha Varma-Nelson appointed to lead STEM Education Innovation and Research Institute at IUPUI, 5/31/2016, IU Newsroom
• NPR Interviews Dr. Pratibha Varma-Nelson on PLTL, 2/19/2017
• Pratibha Varma-Nelson honored by American Chemical Society as outstanding educator, 11/6/2017, Science IUPUI
• Congratulations to Pratibha Varma-Nelson on being inducted as an ACS Fellow, 6/19/2017, Chem.IUPUI
• IUPUI Funds Faculty to Research STEM Ed Innovations, 8/29/2017, Campus Technology
• IUPUI Receives NSF grant to enhance geosciences education, expand community engagement, 10/23/2017, Science IUPUI
• SEIRI celebrating One Year, October, 2017, Office of Academic Affairs Newsletter
• IUPUI researchers to address complex educational challenges in STEM curricula; Inaugural STEM Education, 8/10/2017, News at IU
• George C. Pimentel Award in Chemical Education, 1/8/2018, Chemical & Engineering News
• International symposium on chemistry education honors IUPUI's Pratibha Varma-Nelson, 3/19/2018, IUPUI School of Science

FORMS & HANDOUTS

• SEIRI one-page flyer
• SEIRI Support Form
• Tips for Working Successfully with SEIRI
• Common Flaws in Writing a Proposal
• SEIRI One Year Celebration

NEWSLETTERS

• August 2018
• Spring 2018
• January/February 2018
• October/November 2017
• August/September 2017
• June/July 2017
• April/May 2017
• February/March 2017

https://seiri.iupui.edu/news_events/newsletter/newsletterarchive/index.html
Press Releases, SEIRI News, and Events

https://seiri.iupui.edu/news-events/seirinews/internationalsymposiumhonors.html
International Symposium on chemistry education honors IUPUI’s Pratibha Varma-Nelson
Monday, March 19, 2018

https://seiri.iupui.edu/news-events/seirinews/iupuinsfgeosciences%20.html
IUPUI receives NSF grant to enhance geosciences education, expand community engagement
Monday, October 23, 2017

https://seiri.iupui.edu/news-events/seirinews/georgecpimentelaward.html
Professor Pratibha Varma-Nelson is the winner of the George C. Pimentel Award in Chemical Education
Wednesday, September 20, 2017

https://seiri.iupui.edu/news-events/seirinews/campustechnology.html
IUPUI Funds Faculty to Research STEM Ed Innovations
Tuesday, August 29, 2017

https://seiri.iupui.edu/news-events/seirinews/stemcurricula.html
IUPUI researchers to address complex educational challenges in STEM curricula
Thursday, August 10, 2017

https://seiri.iupui.edu/news-events/seirinews/acsfellowpvn.html
Congratulations to Pratibha Varma-Nelson on being inducted as an ACS Fellow
Monday, June 19, 2017

https://seiri.iupui.edu/news-events/seirinews/melanieschievetop100students.html
SEIRI Undergraduate Researcher Melanie Schieve has been names to the IUPUI top 100 for 2017.
Friday, March 31, 2017

https://seiri.iupui.edu/news-events/seirinews/melanieleadershipwinner.html
Melanie Scheive is listed as a Student Leadership Winner
Tuesday, March 28, 2017

https://seiri.iupui.edu/news-events/seirinews/pratibhaonnpr.html
NPR interviews Dr. Pratibha Varma-Nelson on PLTL
Sunday, February 19, 2017
A SEIRI Faculty Associate serves as a leader in the IUPUI community by engaging in scholarly practices in science, technology, engineering, mathematics, or informatics education such as Scholarship of Teaching and Learning (SoTL) or Discipline-Based Education Research (DBER). Associates are expected to collaborate with SEIRI and support colleagues in their department and school. Ten SEIRI Faculty Associates were selected during September 2018. The following pages list the associates alphabetically and their qualifications.

**Mangilal Agarwal, Ph.D.**

*Director of the Integrated Nanosystems Development Institute (INDI)*  
*Professor of Mechanical and Energy Engineering*  
*Adjunct Professor of Electrical & Computer Engineering and Chemistry & Chemical Biology*

**Expertise:** Nanotechnology, Sensors, Flexible Batteries and Electronic Systems, Internet of Things, STEM Research and Education

My primary research interest is focused on design and development of nano-sensors that can “smell” using a canine-inspired model. These sensors can be applied to various applications and specifically for medical screening and diagnostics. In addition, to make these sensors applicable to wearable devices, my group also investigate the design/fabrication of flexible energy devices and systems.

**Leslie Ashburn-Nardo, Ph.D.**

*Associate Professor*  
*Program Head, Applied Social and Organizational Psychology*  
*Program Head, Industrial/Organizational Psychology*  
*Department of Psychology*

My professional interests involve diversity and intergroup relations. One line of my research program focuses on stereotypes and prejudice – particularly their more subtle, often implicit forms – and the implications such biases have for intra- and intergroup judgments and health and well-being. A second line focuses on strategies for reducing bias and discrimination, such as interpersonal confrontation. I examine these questions not only in the laboratory, but also in more applied contexts, with the long-term goals of improving quality of care and organizational climate for stigmatized group members. I also have some interest in the scholarship of teaching and mentoring, especially with regard to finding ways to improve the academic experiences of students who are members of underrepresented groups.
Charles Feldhaus, Ph.D.

Chair, Technical Leadership and Communication  
Professor, Organizational Leadership and Supervision

Education
• University of Southwestern Louisiana, Radio & television, B.A., 1979
• Indiana University, Secondary Education, B.A., 1985
• University of Louisville, Educational Administration, Ph.D., 1991

Expertise
Organizational Leadership; Coaching and Mentoring; P-12 STEM Education; STEM Workforce Education; Organizational Ethics

Interests
Distance Learning; Post-Secondary/Secondary Partnerships; Faculty Development

Andrew Gavrin, Ph.D.

Department Chair, Physics  Associate Professor, Physics  
Director, Bridges to the Baccalaureate in Central Indiana  
Department of Physics

Scholarly Activities
• Physics Education
• Co-developer of the Just-in-Time Teaching (JiTT) instructional method
• Studies of personal response systems, online forums, online homework, and other educational technologies
• Faculty professional development
• Director, Bridges to the Baccalaureate in Central Indiana  Curriculum development

Condensed Matter
• Design and development of an advanced thin film deposition system for materials research. Magnetic domain imaging as a microstructural probe in Nd-Fe-B magnetic materials.
• Dynamic Magnetic domain imaging for development of amorphous magnetic materials for transformer applications.
• Development of a magnetron sputtering based nanoparticle source for high resolution Bitter microscopy.
• Magnetometry, x-ray diffraction, and other probes of nanostructured metal-insulator and metal-metal composites and multilayers.
Kathleen A. Marrs, Ph.D.

Associate Professor, Director of Woodrow Wilson Indiana Teaching Fellowship Program,
Biology Department, Neuroscience Program

Related Awards
2013  HHMI National Academies Summer Institute Teaching Fellow
2012  IUPUI School of Science Teaching Award
2010  Women Creating Excellence at IUPUI Recognition
2008  IUPUI Chancellor's Award for Excellence in Teaching
2008  Excellence in Teaching Award, National Society of Leadership and Success
2006  IUPUI School of Science Trustees Teaching Award
2005  IUPUI Gateway Scholar, Office for Professional Development
2003  Faculty Colloquium on Excellence in Teaching (FACET) inductee

Related Grants
- Engaging students in authentic interdisciplinary research to enhance quantitative skills (2013) James Marrs, Kathleen Marrs, School of Science Institute for Mathematical Modeling and Computational Science (IM2CS) $5,924
- Central Indiana STEM Talent Expansion Program at IUPUI (2010-2014) Principal Investigator: Jeff Watt, Co-PI; Kathleen Marrs, Charlie Feldhaus, Andy Gavrin, Stephen Hundley (NSF DUE #0969500) $1,995,765.00.
- Midwest Noyce Regional Conference at IUPUI (2010-2011) Principal Investigator: Kim Nguyen, Co-PIs: Kathleen Marrs, John Staver, and Signe Kastberg (NSF DUE #1002638) $353,300
- Noyce Summer Internship Program at IUPUI (2009-2011) Kathleen Marrs, Co-PIs: Kim Nguyen, Dwight Schuster Supplement to Advance Urban Learning: Teach Science (NSF DUE # 0733788-02) $72,000.
- The GK-12 Urban Educators Program at IUPUI (2008-2013) Principal Investigator: Kathleen A. Marrs, Co-PIs: Simon Rhodes, Pam Crowell, Lenore Tedesco, Andy Gavrin (NSF DUE# 0742475) $2,988,355
Snehasis Mukhopadhyay, Ph.D.

Professor, Department of Computer & Information Science

Related Honors, Award and Grants
• Trustee Teaching Award, IUPUI, 2017
• CAREER Award, National Science Foundation, 1996
• NET (Network for Excellence in Teaching) Award, IUPUI, 1995
• Kambhati Memorial Gold Medal, Indiana Institute of Science, 1987
• National Merit Scholarship of the Government of India, 1979-1985

Research Areas:
• Machine Learning
  Project Title: Fast Reinforcement Learning Using Multiple Models and State Decomposition
  Source of Support: National Science Foundation (NSF)
  Collaboration: Yale University
• Intelligent Systems
  Project Title: A secure decision support system for coordination of adaptation planning among Food, Energy, and Water actors in the Pacific Northwest
  Source of Funding: National Science Foundation (NSF)/United States Department of Agriculture (USDA)
  Collaboration: Oregon State University

Evava (Eva) Pietri, Ph.D.

Assistant Professor
Department of Psychology

Related Publications
Saptarshi Purkayastha, Ph.D.

Assistant Professor
Data Science, Health Informatics

Biography
Saptarshi Purkayastha initiates innovative research that focuses on data in the field of health care. He has worked on and helped to implement projects around the world involving:

- National health information systems
- Telemedicine
- CAD applications
- mHealth
- Real time decision-making in robots
- GPGPU acceleration
- Distributed video encoding
- Educational technology for dyslexics

Purkayastha currently is investigating methods for improving engagement in online education, by using guided inquiry learning in the study of health information management. He’s also assisting with a project that’s utilizing virtual reality technology to improve health care delivery for newborns in low- and middle-income nations.

On behalf of the World Health Organization, Purkayastha has served as a consultant to ministries of health in the South-East Asia Region for the implementation of health information systems. Countries that were part of this project included Bangladesh, Nepal, Bhutan, and North Korea.

At IUPUI, the researchers he leads at the Purkayastha Laboratory for Health Innovation are working on projects in radiological information systems, biomedical data analysis, electronic medical records, and mobile and population health.

Research Interests
- Electronic health record (EHR) systems
- Mobile health information systems
- Health information interoperability
- Information infrastructures
Brandon Sorge, Ph. D.

Assistant Professor  
Technology Leadership and Communication  
School of Engineering and Technology

Dr. Sorge is an assistant professor of STEM education research in the Department of Technology Leadership and Communication in the Purdue School of Engineering and Technology at IUPUI as well as a faculty fellow at the STEM Education Innovation and Research Institute. He received is PhD from Purdue University in Technology focusing on STEM workforce development policy. His work in STEM education has encompassed research and evaluation in K-12 education, OBER, and adult education all with a focus on the development of a diverse and STEM literate workforce. Previously, Dr. Sorge ran the day-to-day operations for the Indiana STEMResource Network (I-STEM), a consortium of institutions of higher education, not-for-profits, business and industry, and K-12 schools, hosted by Purdue University. While with I-STEM, he co-founded the Indiana Science Initiative (ISi), which provides over 50,000 Indiana K-8 students and their teacher's access to high-quality, research and inquiry-based science lessons.

Jeffrey X. Watt, Ph.D.

Department Chair, Mathematical Sciences  
Professor, Mathematical Sciences  
The M. L. Bittinger Chair of Mathematics Education  
Department of Mathematical Sciences

Related Research Interests  
My area of specialty is Mathematics Education at the secondary and post-secondary level. My current activities involve closing the achievement gap between high school and college level mathematics, curriculum and instruction development at the undergraduate level, training pre-service mathematics teachers, and professional development for in-service mathematics and science teachers.

Related Honors, Awards and Grants  
2015 Barbara Jackson Outstanding First-Year Student Advocate Award  
2013 Glenn W. Irwin Experience Excellence Recognition Award for Extraordinary Service to IUPUI  
2010 U.S. Professor of the Year Award, Carnegie Foundation for Excellence in Undergraduate  
2009 Mathematical Association of America's Distinguished University Teaching Award  
2004 IUPUI Athletics Department's Favorite Professor Award  
2003 Winner of the John A. Curtis Lecture Award  
2003 IUFrederic Lieber Memorial Award for Distinguished Teaching