



USC WOMEN IN SCIENCE AND
ENGINEERING

ANNUAL REPORT 2017-2018

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Executive Summary

The USC Women in Science and Engineering Program (WiSE) is USC's premiere diversity initiative. Founded in 2000 by an anonymous donation of \$20 million, WiSE is an endowed initiative aimed at increasing the representation of women in tenured and tenure-track faculty positions in the sciences, engineering, and mathematics at USC.

Since the program's inception, WiSE has successfully helped to increase the number of women in these positions in the programs it represents -- the departments of engineering in the USC Viterbi School of Engineering (VSoE) and the departments of mathematics, biological sciences, earth sciences, physics and astronomy, and chemistry in the USC Dana and David Dornsife College of Letter, Arts and Sciences -- from 15 in 2000 to 61 in August 2018 (See Appendix 1). By targeting the recruitment and retention of new women faculty members and by establishing a suite of programs aimed specifically at creating an environment in which women at all stages of their careers may thrive, WiSE serves as a role model for successful diversity efforts at USC, as well as across the country and internationally.

Total WiSE contributions for the 2017-2018 academic year amounted to \$756,500.00 disbursed through 224 grant and awards, including maintenance of the Lloyd Armstrong, Jr. Endowed Chair, held in 2017-2018 by Hanna Reisler, Professor of Chemistry.

During the 2017-2018 recruitment season, WiSE helped add **five new women to the tenure-track faculty**. VSoE welcomes Assistant Professor **Jennifer Treweek** (Biomedical Engineering) and Associate Professor **Mercedeh Khajavikhan** (Electrical Engineering – Electrophysics), and the Dornsife College of Letters, Arts and Sciences welcomes Assistant Professors **Megan Feiser** (Chemistry), **Emily Cooperdock** (Earth Sciences), and Associate Professor **Greta Panova** (Mathematics).

WiSE continues to play an active role in helping to increase the representation of women faculty candidates by hosting meetings with department chairs and search committees to outline strategies for broadening the scope of searches for outstanding diversity candidates. WiSE leadership also actively meets with women faculty candidates during campus visits. During the 2017-2018 academic year, WiSE leadership participated in meetings with 34 formal candidates during their campus visits (22 in Viterbi and 12 in Dornsife) (See Appendix 2). WiSE Support for Facilitating Diversity in Faculty Searches provided 8 grants totaling \$32,450.00 to the departments of Electrical Engineering, Biomedical Engineering, Civil and Environmental Engineering, Biological Sciences (Molecular and Computational Biology), Biological Sciences (Human and Evolutionary Biology), Chemistry, Earth Sciences, and Physics and Astronomy.

WiSE Faculty Accomplishments

Current WiSE faculty members continue to distinguish themselves with campus-wide and national level recognition for their research. In the Viterbi School of Engineering, Assistant Professor **Megan McCain** (Biomedical Engineering) was named a 2018 Young Innovator of Cellular and Molecular Bioengineering by the Biomedical Engineering Society. Associate Professor **Burcin Becerik** (Civil & Environmental Engineering) received the Rutherford Visiting Fellowship from the Alan Turing Institute. She also received the Celebration of Engineering and Technology Innovation (CETI) Award from FIATECH in the outstanding early career category. Assistant Professor **Sze-Chuan Suen** (Industrial & Systems Engineering) received the Pierskalla Best Paper award. Professor **Leana Golubchik** (Computer Science and jointly EE) was appointed to the Stephen and Etta Varra Professorship. Professor **Alice Parker** (Electrical Engineering) was a 2017 inductee to the ECE Alumni Hall of Fame at NC State University. She was also appointed as the new Dean's Professor of Electrical Engineering. Professor **Urbashi Mitra** (Electrical Engineering) was a recipient of this year's IEEE Communications Society WICE (Women in Communications Engineering) Outstanding Achievement Award. She was also appointed as the holder of the Gordon S. Marshall Chair in Engineering. Professor **Andrea Armani** (Chemical Engineering & Materials Science) was appointed as the inaugural holder of the Ray Irani Chair in Engineering and Materials Science. Associate Professor **Yan Liu** (Computer Science) received Biocom's Second Annual Life Science Catalyst Award. Professor **Ellis Meng** (Biomedical Engineering) was named ASME fellow. She was also named BMES (Biomedical Engineering Society) Fellow. Meng received the IEEE Engineering in Medicine and Biology Society (EMBS) Technical Achievement Award, and was elected to serve on the IEEE EMBS Administrative Committee as the North America representative. Assistant Professor **Eun Ji Chung** (Biomedical Engineering) received AIChE's 35 under 35 award in the Bioengineering category. She also received a USC Mentoring Award for faculty mentoring graduate students, and a Young Innovator Award in Nanobiotechnology by Nano Research. Professor **Mahta Moghaddam** (Electrical Engineering) was appointed as the Viterbi School of Engineering's Director of New Research Initiatives. She was also appointed to the William M. Hogue Professorship in Electrical Engineering. Professor **Amy Childress** (Civil and Environmental Engineering) was a Bureau of Reclamation, More Water Less Concentrate Stage 1 Challenge Winner. She was also invited to join the Environmental Engineering and Science Foundation Board of Directors, as well as The Water Research Foundation Academic Council. Professor **Maja Mataric** (Computer Science) was elected Fellow of the Association for the Advancement of Artificial Intelligence.

In the Dornsife College, **Raffaella Ghittoni** (Biological Sciences) and **Nancy Castro** (Biological Sciences) were promoted to Assistant Professors (Teaching). Professors **Judith Hirsch** (Biological Sciences), **Susan Montgomery** (Mathematics), and **Lorraine Turcotte** (Biological Sciences) were appointed holders of the Gabilan Distinguished Professorship in Science and Engineering. Professor **Susan Forsburg** (Biological Sciences) received a USC Mentoring Award for faculty mentoring faculty, postdoctoral scholars, medical residents, and fellows. Professor **Anna Krylov** (Chemistry) received a 2018 Simons Fellowship in Theoretical Physics and the Mildred Dresselhaus Award 2017 at the University of Hamburg for her “outstanding contributions to electronic-structure theory”. Assistant Professor **Irene Chiolo** (Biological Sciences) received an NSF CAREER award. Associate Professor **Sarah Feakins** (Earth Sciences) was named a 2018-2019 AAAS Alan I. Leshner Leadership Institute Public Engagement Fellow.

WiSE Activities

Programming

During the 2017-2018 academic year, the WiSE Program hosted 60+ events and meetings. In order to further aid in the retention of women faculty and to encourage undergraduate and graduate students to pursue careers in the academe, WiSE administers a monthly programming series of “WiSE Talks,” which provide an intimate setting to discuss subjects recommended by the community. The talks are held in the WiSE Suite. This year, notable talks included:

- **“Effective Strategies for Women in Science and Engineering: Addressing Challenges and Opportunities”**
Angela Wilson, Professor of Chemistry
Michigan State University
Thursday, October 26, 2017
- **“Building a Successful Career after the PhD”**
Professors Murali Annavaram (EE), Shaama Sharada (MFD Chemical Engineering), and Felipe de Barros (Civil & Environmental Engineering)
Thursday, November 9, 2017
- **“Sexual Harassment: Conversation and Resources”**
USC RSVP Services
Thursday, March 8, 2018

WiSE continues to provide professional development and networking opportunities for women. In early Fall 2017, WiSE held a happy hour to reconnect faculty after the summer. The following semester, WiSE organized an inclusivity mixer to discuss ways to offset

implicit bias. WiSE also organized and hosted the *WiSE Research Horizons Symposium: A Showcase of Cutting Edge Research in Health, Nano Science, and Sustainability* to showcase WiSE junior faculty members as well as provide opportunities for industrial and foundations funding. The event took place on March 23, 2018 in the Hughes Aircraft Electrical Engineering Center (EEB), Room 132, and was co-chaired by Professors Lorraine Turcotte (Biological Sciences) and Michelle Povinelli (Electrical Engineering) (See Appendix 4).

WiSE also organized and hosted an orientation and information panel for new and current assistant professors. Panelists Murali Annavaram, Suzanne Edmands, Malancha Gupta, Judith Hirsch, Mahta Moghaddam, Hanna Reisler and Remo Rohs, from Dornsife and Viterbi, led discussions about leading a laboratory, navigating the promotion process, and work/family balance.

During the 2017-2018 WiSE Undergraduate Research Experience, students had the opportunity to participate in 36 sessions, including:

Introductions and Mentoring Details	8/30/2017
Renee Wang (Previous WiSE Undergraduate Researcher): Experience after Graduating	9/7/2017
STEM Bytes Seminar	9/15/2017
CV and Resume Writing Workshop	9/19/2017
STEM Bytes Seminar	9/29/2017
Personal Statement Writing Workshop	10/4/2017
STEM Bytes Seminar	10/13/2017
Scholarships, Fellowships and Grants	10/17/2017
STEM Bytes Seminar	10/27/2017
Faculty Guest	11/1/2017
STEM Bytes Seminar	11/10/2017
Imposter Syndrome	11/16/2017
End of the Semester Celebration/Thank you to PhD Mentors	11/28/2017
STEM Bytes Seminar	1/18/2018
Personal Statement Workshop	1/23/2018
STEM Bytes Seminar	1/31/2018
Interview Workshop	2/8/2018
STEM Bytes Seminar	2/13/2018
Lunch with Graduate Students	2/21/2018
STEM Bytes Seminar	3/1/2018
Faculty Guest	3/6/2018
STEM Bytes Seminar	3/21/2018
Guest Speaker – Azita Martin	3/27/2018
STEM Bytes Seminar	4/5/2018

Elevator Pitches	4/11/2018
STEM Bytes Seminar	4/19/2018
End of Semester Celebration	4/24/2018
Introductions and Welcome with PhD Mentors	6/4/2018
Emily Waggoner (Previous WiSE Undergraduate Researcher): Experience with NSF STEMSeas	6/11/2018
Writing a CV	6/18/2018
Mallory Redel: Negotiation Techniques	6/25/2018
How to Write a Personal Statement	7/2/2018
Personal Statement Workshop	7/9/2018
How to Write and Abstract	7/16/2018
Abstract Workshop	7/23/2018
Undergraduate Researcher Mini-Conference	7/27/2018

Upon the conclusion of the WiSE Undergraduate Research Experience for WiSE Summer Researchers, WiSE held a mini-conference (7/23/2018) where the participating undergraduate researchers presented short talks on their summer research to an audience comprised of faculty, staff, PhD students and postdoctoral researchers (See Appendix 5).



Undergraduate Summer Researchers,
Pictured left to right: Natalie Binczewski,
Kristina Kaypaghian, Sydney Feldman, Katelyn
Michael, Kvie Burdsall

The WiSE Faculty Networking Group continues to meet on the last Thursday of each month and enjoyed WiSE-hosted lunches at the beginning of the fall and spring semesters. This year WiSE hosted Dornsife Divisional Dean for Natural Sciences, Stephen Bradforth for lunch during the spring semester. WiSE continues to hold its annual Awards Reception to recognize community achievements (4/18/2018).

New and Revised Awards

During the 2017-2018 academic year, the Women in Science and Engineering Program established an “End of Dissertation Travel Award” for PhD candidates who are nearing degree completion, or Postdoctoral Scholars who have stayed on (after completing their PhD) for a short time at USC. This award provides funds for travel to institutions (or professional meetings) where there may be promising postdoctoral or industry positions, and would be especially beneficial for candidates seeking to change their research area.

In addition, WiSE established a “Visiting Professorship Program”, which serves as a mechanism to raise WiSE visibility and aid in faculty recruitment. The pilot program

facilitates week-long visits. The visiting professor gives a seminar and engages in activities that involve students, with specifics proposed by the USC host faculty member. Applications to host a visitor are reviewed on a rolling basis.

WiSE Outreach

WiSE continues to issue regular newsletters. WiSE also continues to support the USC Young Researchers Program (YRP) annually. YRP hosts a summer research experience devised and executed by USC graduate students for USC-area high school students in the sciences.

This year, WiSE hosted a WiSE Preview Day on October 20, 2017 for the STEM PhD programs in the Dornsife College of Letters, Arts and Sciences. The goal of the event was to increase the number of domestic female applicants to PhD programs in Dornsife. The preview day was an open house event for students at local institutions with backgrounds in the STEM fields interested in pursuing a doctoral degree in at USC. Students met with faculty members and current PhD students and learned more about the research opportunities available to them at USC. There were 20 attendees, and over half of them (through a follow-up survey) said they intended to apply to a STEM PhD program within Dornsife at USC. In addition, on Friday, April 27, 2018 WiSE hosted an afternoon tea and information session for the Computer Science PhD Preview Day hosted by the Viterbi GAPP Office.

Mentoring

In conjunction with WiSE's stated mission to build a supportive environment for women within the University, WiSE faculty mentor women at all levels – ranging from undergraduate to graduate students and postdoctoral scholars to faculty at all levels. Professor Jessica Parr (Chemistry) continued to coordinate the WiSE Undergraduate Research Experience, mentoring 41 undergraduate researchers and fellows; she will continue in her role during the 2018-2019 academic year. In addition, WiSE pairs each undergraduate fellow and researcher with a PhD mentor. The mentors meet with the undergraduate students once per month to discuss professional development and other areas of interest.

2018 Hanna Reisler Mentorship Award

The 2018 Hanna Reisler Mentorship Award, which recognizes individuals at USC who have advanced the careers of women in science and engineering through generous and committed professional mentorship, was awarded to **Andrea Hodge**, Professor of Chemical Engineering and Vice Provost for Undergraduate Programs, to recognize her exceptional mentoring of graduate students.



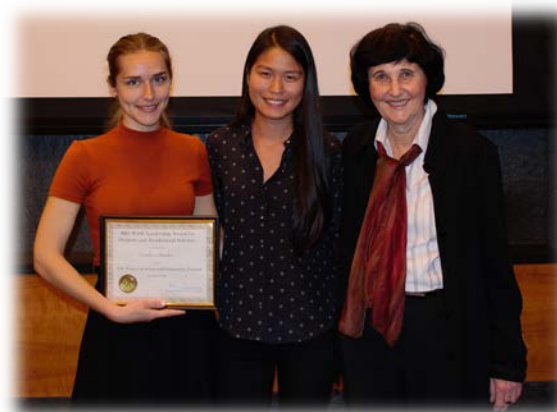
Pictured from left to right: PhD Student Chelsea Appleget, Professor Andrea Hodge, Professor Hanna Reisler, Professor Stacy Finley

2018 Leadership Award for Students and Postdoctoral Scholars

The 2018 Leadership Award for Students and Postdoctoral Scholars, which recognizes exceptional students and postdoctoral scholars at USC who are making a positive difference in their scholarly community, was given to two PhD Students this year: **Carolina Amador** (Chemistry) and **Joycelyn Yip** (Biomedical Engineering).



Pictured from left to right: Professor Ellis Meng (Advisor), PhD Student Nina Yang (Presenter), PhD Student Joycelyn Yip



Pictured from left to right: PhD Student Carolina Amador, PhD Student Nina Yang (Presenter), Professor Hanna Reisler (Chemistry Representative)

Achievements: WiSE Students and Postdoctoral Scholars

Current and past WiSE PhD students and postdoctoral scholars continue to be recognized for their research and accomplishments. Aerospace and Mechanical Engineering PhD student, **Chelsea Appleget** (Advisor: Andrea Hodge), received a NASA Space Technology Research Fellowship (NSTRF). Civil and Environmental Engineering PhD student, **Rebecca**

Peer, received the Annabelle B. Bush Endowed Scholar Award from PEO. Chemistry PhD students, **Ariel Nessler** and **Ashley Espinosa**, and Biological Sciences PhD Student, **Celja Uebel**, received NSF GRFP awards. Biomedical Engineering PhD student, **Marissa Papp** (Advisor: Jill McNitt-Gray), received the Outstanding Teaching Assistant award in Human Anatomy. Previous BME PhD Student, Dr. **Antonia Zaferiou** (Advisor: Jill McNitt Gray), began a tenure-track position in the Department of Orthopedic Surgery at Rush Medical College. She is also the Director of the Motion Analysis Lab. Graduating Mathematics PhD Student, **Guher Camliyurt** (Advisor: Igor Kukavica), has a fellowship at the Institute for Advanced Study at Princeton next year, followed by a three-year postdoctoral position at the University of Chicago. Guher also received the 2018 CAMS Prize for Excellence in Research with a Substantial Mathematical Component. Finishing Mathematics PhD student, **Melike Sirlanci** (Advisor: Gary Rosen) has a two-year postdoctoral position at Caltech. Mathematics PhD student, **Nicolle Sandoval Gonzalez** (Advisor: Sami Assaf), won the Open Arms Travel Grant to attend the International Congress of Mathematicians in Brazil.

Biological Sciences PhD student, **Taehyun Ryu** (Advisor: Irene Chiolo), received the USC PhD Achievement Award and the William Trusten Award for Research Accomplishments, Teaching and Service. Biological Sciences PhD student, **Maria Ruggeri** (Advisor: Carly Kenkel) received an Outstanding Teaching Assistant Award. Biological Sciences PhD student, **Erin McParland** (Advisor: Naomi Levine) received the Gerald Bakus Graduate Fellowship in Marine and Environmental Biology. Computer Science PhD student, **Caitlyn Clabaugh** (Advisor: Maja Mataric) was awarded the USC Order of Arete' Award and the Viterbi Undergraduate Research Mentoring Award. Computer Science PhD student, **Elizabeth Cha** (Advisor: Maja Mataric) received the USC Robotics Lab George Bekey Service Award. Computer Science Postdoctoral Researcher, **Naomi Fitter** (Advisor: Maja Mataric) accepted an Assistant Professor position at Oregon State University.

In addition, current and recent WiSE undergraduates continue to show promise as emerging researchers and leaders. WiSE Undergraduate Researcher **Roxanna Pakkar** received a first place award (Life Sciences Category) and **Kylie Burdsall** received a second place award (Life Sciences Category) for their posters at the USC Undergraduate Symposium for Scholarly and Creative Work. Undergraduate Human Biology Major, **Hanna Weiss** (Advisor: Jill McNitt-Gray), received the Outstanding Student Award in Biomechanics. Undergraduate Mathematics student, **Sabrina Enriquez**, won a Renaissance Scholars Prize. She also received the Excellence in Mathematics for a senior award at USC and will be attending the mathematics PhD program at UC Davis in the fall. WiSE Undergraduate Fellow, **Sydney Prange**, received the Rose Hills Foundation Summer Research Fellowship and the Provost Research Fellowship for two semesters. WiSE Undergraduate Fellow, **Helen Chung**, received the Provost Research Fellowship for two semesters and the summer. WiSE Undergraduate Researcher, **Nina Singh**, received the Goldwater Scholarship and the second year renewal of the Astronaut Scholarship. Previous WiSE Undergraduate Researcher **Justine Lee** (Advisor: Amy Childress) was accepted to graduate school at Stanford University.

Development

In January 2018, in collaboration with the Department of Chemistry, WiSE submitted a proposal to the Anton Burg Foundation and received \$30,000 related to Communication Training for Graduate Students in Science and Engineering. During the 2018-2019 academic year, the WiSE Program will execute a training program for PhD students in the Departments of Chemistry and Chemical Engineering and Materials Science comprised of workshops, panel discussions, lectures by experts, coaching for individual students, in class exercises, and events where students can practice and showcase their communication skills.

WiSE also continued participation on the Work and Family Life Committee this year with explicit focus on facilitating K-12 opportunities at USC, largely in support of faculty recruitment and retention. In addition, WiSE developed an initial industrial partnership model and presented it to the development office with the goal of fostering industry relationships and uncovering potential funding opportunities.

WiSE Leadership

A critical aspect of the success of WiSE is the direct involvement of men and women faculty members, at all career levels and from both the USC Dornsife College and the Viterbi School of Engineering, in planning, evaluating, and guiding the Program's development. With the guidance of its diverse committees, WiSE programs have grown and evolved in response to changing needs. Continued evaluation of the success and utility of programs have helped to keep them relevant and effective.

WiSE Program Staff



Leana Golubchik, Professor of Computer Science and Electrical Engineering in the Viterbi School of Engineering, serves as Director of the WiSE Program. Golubchik was appointed as Director in September 2010.



Mallory Redel serves as the WiSE Program Manager and administers program development, operations, finance and committee coordination. Mallory joined WiSE in November 2014. She holds a Bachelor of Science in Journalism from Middle Tennessee State University and a Master of Science in Social Entrepreneurship from the University of Southern California.



Jessica Parr, Associate Professor of Chemistry (Teaching) in the Dornsife College of Letters, Arts and Sciences serves as the WiSE Undergraduate Research Experience Program Coordinator. She has been leading the undergraduate program since Fall 2013.

WiSE Advisory Board

The WiSE Advisory Board met twice per semester in 2017-2018 (9/20/2017, 12/5/2017, 2/1/2018, and 4/10/2018) and continues to work with program administration to hone its recruitment and support of programs for maximum impact. The first meeting in the spring semester is joint with the USC Dornsife College and Viterbi School Committees.

During the 2017-2018 academic year, the Board devoted attention to different topics that included recruitment and retention of tenure-track and tenured faculty, childcare, attracting graduate students, partnerships with industry, raising the profile of teaching faculty, and forums to exchange ideas with PhD students. As always, the Board remains dedicated to mentorship, as it is key to all WiSE endeavors.

As WiSE approaches its 20th anniversary, it made sense to look at how USC performs compared to other institutions in promoting gender equity. Thus, the Board reviewed data collected by the program in order to calibrate local successes and shortcomings. With respect to gender balance at the faculty level, USC lags behind topmost institutions in many areas. The Board recommended that WiSE continue to work with department chairs in WiSE-eligible departments to help implement policies that promote diversity. Graduate student recruiting remains an area of concern, not only for creating a pipeline of young scientists ready to take on future challenges but also for providing our faculty with the talented research teams needed to remain competitive. The Board discussed new ways in which WiSE can assist doctoral candidates following their graduation. The reality is that faculty positions have become increasingly difficult to obtain. Thus, industry is an attractive option for many young women; there are too few women in the junior ranks in technical fields, let alone in leadership positions. Hence, with support of the Board, WiSE leadership approached the development office about ideas for professional

development and networking to devise means to place our graduates in industry. The plan is that the University can help approach representatives of established companies to fund fellowships towards this end.

The Board noted that the community of teaching faculty at the University has grown; many of these faculty are women. Respect, support and acknowledgment of our teaching faculty enhances the quality of education at USC and helps mitigate bias against faculty who do not hold tenure-track positions. Most teaching faculty came to their positions through their own doctoral research and some strongly advocate for an intramural mechanism to support limited research. While WiSE does not have resources to support this type of programming, the Board suggested that by highlighting this issue with USC leadership, the University might support such a mechanism. In addition, the Board discussed pilot initiatives that WiSE could support, including partial teaching relief during summer to allow faculty to develop new courses and retreats lead by teaching faculty that focus on specific activities to improve the quality of education at the University.

Each year, the topic of childcare emerges during conversations with members of the Board and wider community. The Board was relieved that the new USC childcare facility opened at UPC this year and that space was found for children of our faculty. It remains imperative that childcare facilities operate at a capacity that serves the full community, and the Board encouraged WiSE to remain vigilant in advocating for these resources.

2017-2018 WiSE Advisory Board Members



Judith Hirsh (Chair)
Professor of Biological Sciences, Neurobiology
USC Dornsife College of Letters, Arts & Sciences



Murali Annavaram
Associate Professor of Electrical Engineering-Systems
USC Viterbi School of Engineering



Linda Duguay
Associate Professor (Research) of Biological Sciences, MEB
USC Dornsife College of Letters, Arts & Sciences



David D'Argenio
Professor of Biomedical Engineering
USC Viterbi School of Engineering



Raffaella Ghittoni
Lecturer, Biological Sciences
USC Dornsife College of Letters, Arts & Sciences



Leana Golubchik (Ex-officio, WiSE Director)
Professor of Computer Science and Electrical Engineering
USC Viterbi School of Engineering



Julie Higle
Professor and Chair of Industrial & Systems Engineering
USC Viterbi School of Engineering



Anna Krylov
Professor of Chemistry
USC Dornsife College of Letters, Arts & Sciences



Susan Montgomery
Professor of Mathematics
USC Dornsife College of Letters, Arts & Sciences



Hanna Reisler
Professor of Chemistry
USC Dornsife College of Letters, Arts & Sciences



Remo Rohs
Associate Professor of Biological Sciences, MCB
USC Dornsife College of Letters, Arts & Sciences



Shang-Hua Teng
Professor of Computer Science
USC Viterbi School of Engineering

WiSE PhD Advisory Board

During the 2017-2018 academic year, WiSE established a PhD Advisory Board to further WiSE efforts in serving the PhD Community. The Board focused on uncovering topics of interest to the STEM PhD Community at USC, and during the 2018-2019 academic year, it will host a series of events based on their findings.

2017-2018 WiSE PhD Advisory Board Members

- **Eun Ji Chung** (Faculty Mentor), Assistant Professor Biomedical Engineering, Viterbi School of Engineering
- **Naomi Levine** (Faculty Mentor), Assistant Professor Biological Sciences (MEB), Dornsife College of LAS
- **Caitlin DeAngelo**, PhD Student, Chemistry, Dornsife College of LAS
- **Alexa Hudnut**, PhD Student, Biomedical Engineering, Viterbi School of Engineering
- **Sarah Katz**, PhD Student, MFD Chemical Engineering & Materials Science, Viterbi School of Engineering
- **Samantha McBirney**, PhD Student, Biomedical Engineering, Viterbi School of Engineering
- **Rebecca Peer**, PhD Student, Civil and Environmental Engineering, Viterbi School of Engineering
- **Joyce Yager**, PhD Student, Earth Sciences, Dornsife College of LAS
- **Nina Yang**, PhD Student, Biological Sciences, Dornsife College of LAS

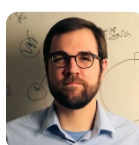
USC Dornsife WiSE Committee

Committees composed of faculty in each school serve as advisors on grant-making by reviewing and evaluating the applications and making recommendations for funding.

2017-2018 WiSE Dornsife Committee Members



Jill McNitt-Gray (Chair)
Professor of Biological Sciences and Biomedical Engineering
USC Dornsife College of Letters, Arts & Sciences



James Boedicker
Assistant Professor of Physics and Astronomy
USC Dornsife College of Letters, Arts & Sciences



Suzanne Edmands
Professor of Biological Sciences, MEB
USC Dornsife College of Letters, Arts & Sciences



Gary Rosen
Professor of Mathematics
USC Dornsife College of Letters, Arts & Science

A summary of the reviews conducted by the USC Dornsife Committee during the academic year follows:

Program	Deadline	Number of Applicants/ Nominations	Number of Awards
Undergraduate Research, Fall	5/16/17	10	10
Undergraduate Research, Spring	12/1/17	13	10
Graduate Merit	4/8/18	7	2 (4 honorary)
Graduate Top-Off	3/3/18	13	4 (8 offered)
Undergraduate Research, Summer	4/1/18	9	4 (7 offered)

USC Viterbi WiSE Committee

Committees composed of faculty in each school serve as advisors on grant-making by reviewing and evaluating the applications and making recommendations for funding.

2017-2018 WiSE Viterbi Committee Members



Malancha Gupta (Chair)
Associate Professor of Chemical Engineering & Materials Science
USC Viterbi School of Engineering



Felipe de Barros
Assistant Professor of Civil & Environmental Engineering
USC Viterbi School of Engineering



Aleksandra Korolova
Assistant Professor of Computer Science
USC Viterbi School of Engineering



Megan McCain
Assistant Professor of Biomedical Engineering
USC Viterbi School of Engineering

A summary of the reviews conducted by the USC Viterbi Committee during the academic year follows:

Program	Deadline	Number of Applicants/ Nominations	Number of Awards
Undergraduate Research, Fall	5/16/17	7	7
Undergraduate Research, Spring	12/1/17	9	9
Graduate Merit	4/8/18	6	2 (4 honorary)
Graduate Top-Off	3/3/18	9	4 (8 offered)
Undergraduate Research, Summer	4/1/18	6	1 (4 offered)

New Faculty



Emily H. G. Cooperdock will be joining the USC Department of Earth Sciences as an Assistant Professor in Summer 2019. Emily received her BA in Earth Sciences and Portuguese Studies at Columbia University in 2011. Afterward, she took 5 months to through-hike the Appalachian Trail from Maine to Georgia. She then earned her PhD in Geological Sciences from the Jackson School of Geosciences at The University of Texas at Austin in August 2017 under the supervision of Daniel Stockli. She is currently a Postdoctoral Scholar at Woods Hole Oceanographic Institution in Woods Hole, Massachusetts working with Frieder Klein and Veronique Le Roux.



Megan Fieser will be joining the USC Department of Chemistry as a Gabilan Assistant Professor in Fall 2018. She received her Ph.D. in chemistry from the University of California, Irvine, working in the group of William J. Evans. She recently completed a Postdoctoral Associate position in the NSF Center for Sustainable Polymers at the University of Minnesota, working in the group of William B. Tolman.



Mercedeh Khajavikhan will be joining the USC Department of Electrical Engineering – Electrophysics in January 2019. She received her Ph.D. in Electrical Engineering from the University of Minnesota in 2009. Her dissertation was on coherent beam combining for high power laser applications. In 2009, she joined the University of California in San Diego as a postdoctoral researcher where she worked on the design and development of nanolasers, plasmonic devices, and silicon photonics components. Since August 2012, she has been a faculty in the College of Optics and Photonics (CREOL) at the University of Central Florida (UCF). Her work is primarily focused on observation and application of novel phenomena in active photonic platforms. She received the NSF Early CAREER Award in 2015, the ONR Young Investigator Award in 2016, the University of central Florida Reach for the Stars Award in 2017, and DARPA Young Faculty Award in 2018.



Greta Panova will be joining the USC Department of Mathematics as an Associate Professor in Fall 2018. Prior to that she was a von Neumann Fellow at the Institute for Advanced Study in Princeton (2017-2018) and an Assistant and Associate Professor at the University of Pennsylvania (2014-2018). She was a Visiting Associate Professor at Institute Henri Poincare in Paris in the Winter quarter of 2017, and a Simons Postdoctoral Fellow at UCLA in 2011-2014. She received her PhD in Harvard University Department of Mathematics in 2011, an M.A from UC Berkeley in 2006 and a BS degree in Electrical Science and Engineering and a BS in Mathematics from MIT in 2005.



Jennifer Treweek will be joining the USC Department of Biomedical Engineering as a Gabilan Assistant Professor in January 2019. She holds a B.S. in Chemistry and Economics from Caltech, and she completed her Ph.D. in Chemistry at The Scripps Research Institute (2011), where she was advised by Dr. Kim Janda. Major thesis projects included the design of immunotherapies to combat drug abuse and the in vivo validation of a chemical hypothesis for the aberrant formation of methamphetamine-conjugated advanced glycation endproducts during drug addiction. Jenny then returned to Caltech as a postdoctoral fellow and NARSAD Young Investigator in the Division of Biology and Bioengineering, where her research with Dr. Viviana Gradinaru has centered on the optimization of tissue-clearing methodologies and their application to mapping neurocircuits involved in the regulation of sleep, mood, and psychomotor behaviors.

WiSE Financial Awards

The WiSE Program has adhered closely to the original structure of funds allocation outlined by the 2000 WiSE Task Force: \$500k for Recruitment/Retention; \$100k for Undergraduate Research; \$250k for PhD Student and Postdoctoral Support; and the remaining funds to support new additional programs. Actual distribution of funds may vary slightly each year depending on the return of investment income on the WiSE endowment and on the number of candidates who accept WiSE awards.

WiSE Jr. Gabilan Chairs

During the 2017-2018 recruitment season WiSE awarded WiSE Gabilan Jr. Chairs to two new faculty hires.

Jennifer Treweek	Biomedical Engineering	Viterbi
Megan Fieser	Chemistry	Dornsife

Formal Program Awards

Program	# Awards
Faculty Recruitment / Faculty Retention	22
Major Support for Current Faculty	0
WiSE Gabilan Jr. Chair	2
WiSE Gabilan Distinguished Professorship	7
Lloyd Armstrong, Jr. Chair	1
Support for Facilitating Diversity in Faculty Searches	8
Faculty Bridge Funding	0
Supplemental Faculty Support	33
Merit Award for Excellence in Postdoctoral Research	0
Graduate Top-Off Awards	8
Merit Fellowships for Current PhD.	4
Travel Grants	84
Undergraduate Research Grants	41
Child Care Subsidies	6
Support for Faculty Pregnancy, Childbirth, and Adoption	0
Support for PhD. and Postdoc Pregnancy, Childbirth, and Adoption	1
WiSE Leadership Award for Students and Postdoctoral Scholars	2

Discretionary Awards

In addition to its formal suite of programs, costs were incurred in support of program activities (such as receptions, supporting a cohort of new assistant professors, lecturers, website maintenance, etc.) and administrative expenses, WiSE also awarded several discretionary grants to support activities that work toward the goal of increasing the representation of women in science and engineering. In 2017-2018, these awards included:

Group	Purpose
USC Department of Computer Science	To support travel of USC undergraduate and PhD. students to the Grace Hopper Celebration of Women in Computing.
Women in Computing	To support the annual activities for women undergraduate students in the Department of Computer Science.
Women in Chemistry	To support the annual activities for women postdocs and PhD students in the Department of Chemistry.
Young Researchers Program	To support a summer research experience devised and executed by USC graduate students for USC-area high school students in the sciences.

Charlotte's Web (Women in Math)	To support the annual activities of the networking and professional development group among women students in the Department of Mathematics.
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APPENDIX 1:

Current WiSE Faculty, Tenured and Tenure-Track (Including New Hires)

USC Dornsife College

Life Sciences

Sarah Bottjer	Professor	Biological Sciences (Neuro)
Suzanne Edmands	Professor	Biological Sciences (MEB)

Susan Forsburg	Professor	Biological Sciences (MCB)
Judith Hirsch	Professor	Biological Sciences (Neuro)
Emily Liman	Professor	Biological Sciences (Neuro)
Jill McNitt-Gray	Professor	Biological Sciences (HEB)
Lorraine Turcotte	Professor	Biological Sciences (HEB)
Liang Chen	Associate Professor	Biological Sciences (MCB)
Wiebke Ziebis	Associate Professor	Biological Sciences (MEB)
Irene Chiolo	Assistant Professor	Biological Sciences (MCB)
Carly Kenkel	Assistant Professor	Biological Sciences (MEB)
Naomi Levine	Assistant Professor	Biological Sciences (MEB)
Carolyn Phillips	Assistant Professor	Biological Sciences (MCB)
Lindsey Schier	Assistant Professor	Biological Sciences (HEB)

Physical Sciences / Mathematics

Susan Friedlander	Professor	Mathematics
Anna Krylov	Professor	Chemistry
Jia Grace Lu	Professor	Physics & Astronomy
Susan Montgomery	Professor	Mathematics
Elena Pierpaoli	Professor	Physics & Astronomy
Hanna Reisler	Professor	Chemistry
Rosa di Felice	Associate Professor	Physics & Astronomy
Sarah Feakins	Associate Professor	Earth Sciences
Juhi Jang	Associate Professor	Mathematics
Greta Panova	Associate Professor	Mathematics
Sami Assaf	Assistant Professor	Mathematics
Emily Cooperdock	Assistant Professor	Earth Sciences
Megan Feiser	Assistant Professor	Chemistry
Smaranda Marinescu	Assistant Professor	Chemistry

The USC Viterbi School of Engineering

Andrea Armani	Professor	Chemical Engineering and Materials Science
Amy Childress	Professor	Civil and Environmental Engineering
Leana Golubchik	Professor	Computer Science
Julie Higle	Professor	Industrial and Systems Engineering
Andrea Hodge	Professor	Chemical Engineering and Materials Science
Eva Kanso	Professor	Aerospace and Mechanical Engineering
Maja Matarić	Professor	Computer Science
Ellis Meng	Professor	Biomedical Engineering
Urbashi Mitra	Professor	Electrical Engineering
Mahta Moghaddam	Professor	Electrical Engineering
Alice Parker	Professor	Electrical Engineering
Burcin Becerik-Gerber	Associate Professor	Civil and Environmental Engineering
Malancha Gupta	Associate Professor	Chemical Engineering & Materials Science
Mercedeh Khajavikhan	Associate Professor	Electrical Engineering
Yan Liu	Associate Professor	Computer Science
Michelle Povinelli	Associate Professor	Electrical Engineering
Katherine Shing	Associate Professor	Chemical Engineering & Materials Science
Nora Ayanian	Assistant Professor	Computer Science
Heather Culbertson	Assistant Professor	Computer Science
Bistra Dilkina	Assistant Professor	Computer Science
Eun Ji Chung	Assistant Professor	Biomedical Engineering
Dina El-Damak	Assistant Professor	Electrical Engineering
Stacey Finley	Assistant Professor	Biomedical Engineering
Aleksandra Korolova	Assistant Professor	Computer Science
Megan McCain	Assistant Professor	Biomedical Engineering
Kelly Sanders	Assistant Professor	Civil and Environmental Engineering
Maryam Shanechi	Assistant Professor	Electrical Engineering
Shaama Sharada	Assistant Professor	Chemical Engineering & Materials Science
Sze-Chuan Suen	Assistant Professor	Industrial and Systems Engineering
Jennifer Treweek	Assistant Professor	Biomedical Engineering
Alejandra Uranga	Assistant Professor	Aerospace and Mechanical Engineering
Phebe Vayanos	Assistant Professor	Industrial and Systems Engineering
Cristina Zavaleta	Assistant Professor	Biomedical Engineering

APPENDIX 2:

Faculty Candidates Interviewed On Campus

As in previous years, WiSE leadership offered to meet with women faculty candidates during their visits to campus, both to transmit information about the WiSE Program and resources and to provide opportunities for candidates to ask questions about USC and work-family issues that they might not ordinarily feel comfortable discussing as part of their formal interview process. Departments continued to take advantage of this offer and senior WiSE faculty met with 34 faculty candidates over the course of 2017-2018. The list of candidates is below:

Jenny Wilson	Mathematics	9/6/2017
Ellen Eischen	Mathematics	9/20/2017
Megan Feiser	Chemistry	12/4/2017
Sheri Floger	Biological Sciences - MEB	1/17/2018
Negar Kiyavash	Electrical Engineering - Systems	1/24/2018
Stephanie Coronel	Aerospace and Mechanical Engineering	1/24/2018
Kara Peters	Aerospace and Mechanical Engineering	2/8/2018
Elizabeth Bell	Earth Sciences	2/8/2018
Tanja Hinde	Physics and Astronomy	2/14/2018
Elizabeth Proctor	Biological Sciences - MCB	2/15/2018
Ann Bauer	Earth Sciences	2/20/2018
Ashley Hammond	Biological Sciences - HEB	2/21/2018
Emily Cooperdock	Earth Sciences	2/27/2018
Grace X. Gu	Aerospace and Mechanical Engineering	3/1/2018
Assieh Saadatpour	Biological Sciences - MCB	3/1/2018
Deblina Sarkar	Electrical Engineering - Electrophysics	3/2/2018
Zhiting Tian	Aerospace and Mechanical Engineering	3/6/2018
Huijia Lin	Computer Science	3/6/2018
Iryna Zenyuk	Aerospace and Mechanical Engineering	3/8/2018
Cise Unluer	Civil and Environmental Engineering	3/8/2018
Meryem Simsek	Electrical Engineering - Systems	3/20/2018
Nithya Sambasivan	Computer Science	3/21/2018
Elisa Franco	Electrical Engineering - Systems	3/22/2018
Limei Tian	Electrical Engineering - Electrophysics	3/23/2018
Himabindu Lakkaraju	Computer Science	3/26/2018
Rabia Yazicigil	Electrical Engineering - Systems	3/29/2018
Mercedeh Khajavikhan	Electrical Engineering - Electrophysics	3/30/2018
Marina Radulaski	Electrical Engineering - Electrophysics	4/2/2018
Monia Ghobadi	Electrical Engineering - Systems	4/5/2018
Negar Reiskarimian	Electrical Engineering - Electrophysics	4/9/2018

He He	Computer Science	4/9/2018
Neha Kumar	Computer Science	4/10/2018
Katherine Driggs-Campbell	Electrical Engineering - Systems	4/19/2018
Julia Widom	Chemistry	12/14/2018

APPENDIX 3:

Samples of WiSE Events Flyers

The USC Women in Science and Engineering Program



Presents

Angela K. Wilson, PhD

**John A. Hannah Distinguished Professor of Chemistry
Michigan State University**



**"Effective Strategies for Women in Science and Engineering:
Addressing Challenges and Opportunities"**

Thursday, October 26, 2017

Talk: 11:00am

Ronald Tutor Hall (RTH), Room 526

At all ages and stages of our education and careers, from the time we are students to the time we are in senior level positions, we encounter a broad range of challenges and opportunities. For some women, maximizing and overcoming these factors can propel them to success; but, for others, the challenges can become daunting, becoming factors that drive them from STEM careers at all stages. Here, strategies and considerations that can be effective for women, men, and employers, regardless of sector, in terms of moving women forward, and striving towards level playing fields are presented. A part of this presentation provides an account of how career obstacles, from early career and education challenges to those encountered in more advanced career stages, can be turned around into desirable career opportunities (though in some cases via non-traditional pathways), enabling new, unexpected career directions.

Contact WiSE at (213) 740-0996 or wiseprog@usc.edu for further details



THE USC WOMEN IN SCIENCE AND ENGINEERING
PROGRAM PRESENTS:

WISE PREVIEW DAY

Friday, October 20th from 9:30am-3:30pm
@ University of Southern California

-Meet with PhD students from the departments of
Biological Sciences, Mathematics, Physics & Astronomy,
Chemistry, and Earth Sciences

-Participate in faculty talks

-Learn more about STEM doctoral programs within the
Dornsife College of Letters, Arts and Sciences at USC

-Register at: <https://goo.gl/forms/42Auv42jPgnPYTjZ2>

APPENDIX 4:

WiSE Research Horizons Symposium



Pictured from left to right: Professors Scott Kanoski (Moderator), Lindsay Schier, Eunji Chung, Sze-Chuan Suen, Caroline Phillips (all speakers)



Attendees of symposium



Attendees of symposium



Attendees of symposium



Pictured from left to right: Professors Kelly Sanders (Moderator), Carly Kenkel, Bistra Dilkina, Naomi Levine (all speakers)



All speakers, panelists, panel moderators and organizers of the symposium

APPENDIX 5:

WiSE Undergraduate Researcher Mini-Conference

WiSE Undergraduate Summer Research Mini-Conference



Friday, July 27th 2018
9:20 am – 12:30 pm

Schedule

9:30 – 9:55	Coffee
9:55 – 10:00	Introductory Remarks
10:00 – 10:20	Kylie Burdsall <i>Professor Raymond Stevens</i>
10:20 – 10:40	Katelyn Michael <i>Professor Travis Williams</i> <i>Professor Steven Nutt</i>
10:40 – 11:00	Sydney Feldman <i>Professor Elena Pierpaoli</i>
11:00 – 11:20	Natalie Binczewski <i>Professor Vsevolod Katritch</i>
11:20 – 11:40	Kristina Kaypaghian <i>Professor Andrea Armani</i>
11:40 – 11:45	Closing Remarks
11:45	Lunch

Gaining Systematic View of Phosphorylation in Pancreatic Beta Cells

Kylie Burdsall, Professor Raymond Stevens

Diabetes, a disease characterized by insulin resistance or insufficient insulin output, is a growing global epidemic that affects more than 700 million people worldwide; yet, there is currently no cure and treatment options are limited. This drives our aim to better understand the signaling mechanisms of pancreatic beta cells, the source of insulin secretion, and to discover novel targets for diabetes drug intervention. We are using mass spectrometry based proteomics to examine transient changes in protein phosphorylation, a critical regulatory mechanism for many cellular processes including the control of both blood sugar and insulin secretion. Mass spectrometric approaches allow us to capture a snapshot of changes induced by various stimuli, namely glucose perturbation and the activation G-Protein Coupled Receptors (GPCRs) with common Type 2 Diabetes treatments. A challenge to capturing changes in the phosphoproteome is the low abundance of phosphorylated peptides, particularly phosphotyrosine (pTyr). To combat this challenge, we tested various methods of phosphorylated peptide enrichment to develop our own pipeline for future experiments. The data produced by these experiments will allow us to elucidate the unbiased effects of various forms of stimulation on pancreatic beta cells and discover novel phosphorylation sites as sources for diabetes drug intervention.

Catalysis of the Oxidative Degradation of Fiber Reinforced Epoxy Composites

Katelyn Michael, Yijia Ma, Carlos Navarro, Professor Travis Williams, Professor Steven Nutt

Carbon Fiber Reinforced Polymer (CFRP) composites are widely used structural materials with applications from aerospace to sporting goods. A major obstacle to its expanded use in the energy and transportation sector is the lack of an efficient recycling procedure. Current recycling techniques utilize forcing conditions which are neither environmentally friendly nor sufficient for the thousands of tons of waste produced each year. Our goal is to catalytically depolymerize amine-cured epoxy CRFP composites to allow for the recovery of high-value, undamaged carbon fibers as well as small molecule monomers from the matrix. These can be used to regenerate precursors to new composite resin. We have previously published the mechanism for the hydrogen peroxide and acetic acid mediated depolymerization and proposed the key steps are oxygen atom transfer followed by elimination. We conducted oxygen atom transfer catalyst screenings to find aerobic depolymerization conditions. We did this by monitoring the decomposition of a small molecule analog containing the key linkages of our material with acetic acid and 10 mole percent of the catalysts. This was monitored via NMR. We found MnCl₂ is most effective, combined with ScCl₃ as an elimination catalyst and air as the terminal oxidant. For the first time, we have isolated a small molecule from the resin digest. Future work includes converting the recovered molecule back to a resin monomer, demonstrating scalability on commercial pre preg scrap (pre preg is pre-impregnated composite fibers where the epoxy resin is present but not fully cured), and demonstrating the utility of our reformulated resins.

The Impact of Doppler and Aberration Effects on Extragalactic Foreground Observations

Sydney Feldman, Siavash Yasini, Professor Elena Pierpaoli

Our measurement of the relic radiation from the big bang, known as the Cosmic Microwave Background (CMB), from the vicinity of Earth has a kinematic contribution due to the peculiar motion of the Solar System. This kinematic component, which is the result of the relativistic Doppler and aberration effects, needs to be removed from the CMB measurements, before any further analysis on the data. We can calculate the kinetic contribution of our motion in the universe and use that to determine a rest frame calculation, effectively separating the motion induced dipole from any possible intrinsic dipole, as has been shown in Yasini & Pierpaoli 2017. The results from that study has prompted me to investigate the impact of relativistic Doppler and aberration effects on other observational data, as the Earth moves with respect to all

extragalactic sources. The particular data that I analyzed was the thermal Sunyaev-Zel'dovich (tSZ) angular power spectrum, which measures the inverse Compton scattering of the CMB as it passes through high energy electron clouds between clustered galaxies. Using Yasini's computational methods, I wrote a program in Python that estimated the change in the amplitude of the tSZ effect due to the motion of the Solar System. The resultant shifted data set showed a negligible effect - less than a 0.5% shift at all angular scales. I am now working towards creating a suitable model for extragalactic point source data, applying the relativistic Doppler effect, determining the magnitude of the resulting shift, and analyzing the implications. Assessing whether or not our motion has an effect on how we observe extragalactic foregrounds, as well as the magnitude of this effect will be extremely useful as an independent measure for the peculiar velocity of the Solar System with respect to the CMB rest frame as well as a source of error cosmological parameter estimation from small angular scales of the CMB.

Angiotensin II Type 2 Receptor (AT2R) Ligand Design: Hit Optimization

Natalie Binczewski, Barbara Zarzycka, Professor Vsevolod Katritch

In the United States alone, there are 20 million people suffering from neuropathic pain, but treating the nerve damage or malfunctioning nervous system causing burning or shooting sensations proves challenging. One new direction is to target the Angiotensin II Type 2 Receptor (AT2R) since its crystal structure was solved one year ago and its activation has been observed to induce neurite outgrowth. The Katritch Lab has already found a compound that is an experimentally validated hit (BRI-6001) that binds to AT2R, which we use as a starting point to begin hit optimization. This compound was optimized by analyzing its predicted binding pose and the structure of the receptor pocket to design compounds with higher affinities for AT2R than the first hit. With the ICM Pro software, we used the ligand editor to design compounds with the same scaffold as BRI-6001 that are predicted to increase hydrophobic or hydrogen bonding interactions in AT2R. After docking over 600 designed compounds to AT2R in duplicate, the binding poses and scores were evaluated to predict improved binders and eventually evaluate the structure activity relationship. From this, we have determined eight new compounds that have the potential to be better binders to AT2R than BRI-6001. Some compounds are already commercially available, but others may need to be synthesized. With this information, we must next contact companies to order our chosen compounds and then send them to an experimental lab for testing.

Portable, rapid magneto-optical diagnostic for early-stage malaria utilizing a smartphone-based biosensor

Kristina Kaypaghian, Samantha McBirney, Dongyu Chen, Andrea Armani

Despite global efforts to eliminate this disease, malaria persists as the leading cause of morbidity and mortality, infecting over 200 million people a year, resulting in over 500,000 deaths. However, if the infection can be identified early enough, treatment is highly effective. Thus, early diagnosis of malarial infection is a crucial step to eradicating malaria. Light microscopy, the gold standard for malaria diagnosis, is expensive, labor-intensive, and low-throughput, while antibody-based diagnostic tests are dependent on reagents that are unstable in low-resource environments. To address this, the Armani Lab is developing a portable, high-throughput optical screening device that detects hemozoin, a magnetic by-product generated by the malaria parasite whose presence indicates malarial infection, in whole blood with no additional reagents. By applying a magnetic field and using the smartphone camera to take single-wavelength transmission measurements, hemozoin can be detected by changes in intensity. In this study, we are designing and 3D printing prototypes of the smartphone-compatible system, synthesizing magnetic nanoparticles to mimic hemozoin for testing, and developing an iOS application to automate the image acquisition and analysis process. The anticipated outcome is the system's ability to detect clinically relevant concentrations of magnetic nanoparticles that correspond to < 100 parasites/ μL . This novel approach will contribute to the global efforts of eradicating malaria.