

University of Arkansas

Microelectronics-Photonics (μ EP) Graduate Program

Micro to nanoscale materials, processing, and devices

The Microelectronic-Photonics (μ EP) Graduate Program at the University of Arkansas, Fayetteville, is an interdisciplinary graduate program started in 1998 that offers both MS and PhD degrees. The μ EP program is designed to expand a student's knowledge beyond the boundaries of traditional departmental based graduate programs. Students in μ EP will participate in cross-



departmental research, will take applications-intensive classes from multiple engineering and science departments, and will develop workplace productivity skills in a simulated industrial environment.

The outcome of a student's graduate education in this interdisciplinary environment is knowledge of advanced materials, processing, and devices at the micro and nano scale; of applications in electronics, photonics, and chemical/biological systems; and of the economics that affect successful introduction of these devices and systems into industry and society.

Mission

The educational objective of the μ EP Graduate Program is a program graduate fully prepared to drive the development and commercialization of micro and nano scale materials and devices for the good of society.

A rigorous interdisciplinary graduate technical education, including soft skills training, will be used to accomplish this mission.

Operations

Students in the μ EP program report directly to both their major research professor and to the μ EP director, Rick Wise. Dr. Wise has extensive experience as both a researcher and an engineering manager at Texas Instruments, a leading multinational semiconductor company. He brings more than 30 years of experience in

the microelectronics industry to the μ EP program director position.

He leads and directs μ EP students as an industry-like team, with focus on achieving the common goal of each student's individual educational success. Each year's students are grouped into a Cohort, a natural work group who share common needs, experiences, and training.

Student Research

The students who enter μ EP come from rigorous engineering or science programs such as Chemical, Biomedical, Mechanical, or Electrical Engineering, Materials Science, Math, Chemistry, Physics, or Optics.

Upon entering the μ EP program, a customized interdisciplinary science, engineering and business curriculum is created to support each student's career interests. The students work with faculty from almost any science or engineering department, with over half of the μ EP students doing their research project with faculty from a department different from the student's prior traditional departmental degree.

Research laboratories on campus include advanced semiconductor materials in the molecular beam epitaxy facilities in the NANO and Physics building; advanced chemical processing in the Chemistry Research building; and photonic materials in the Physics and EE Departments' processing and analytical labs. In these facilities students create and observe atomic to microscopic interactions between materials and the environment around them.

Research can also be pursued in HiDEC (High Density Electronics Center), a world-class full flow processing and packaging facility including a 6,500 square foot clean room facility for processing 150 mm wafers. The techniques and materials developed here allow the integration of photonic and electronic devices into miniaturized solid state systems that support ultra-fast communications, intricate sensor applications, and many other complex devices and systems.



μEP Graduates

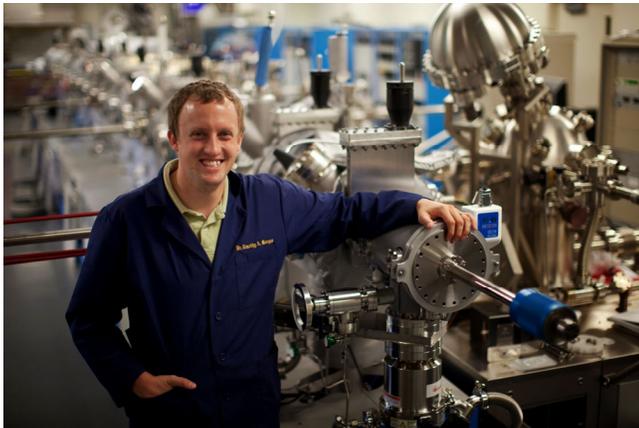
The μEP program produced its first MS μEP graduates in August 2000, and has now graduated 78 PhD students and 160 MS students, with many of the MS graduates continuing their studies toward a PhD μEP degree. Most graduates have taken positions at major technology companies, but several graduates have joined early- to mid-stage technology startup companies or accepted academic positions. Several MS and PhD graduates work with research-based companies in Fayetteville.

Fellowships

The μEP program's students can compete for Distinguished Doctoral Fellowships (DDF) and Doctoral Academy Fellowships (DAF) at \$22K and \$12K per year, respectively, to support highly qualified PhD students for up to four years. These fellowships are in addition to the graduate assistantship stipends (of at least \$18K per year) which are assured for DDF/DAF recipients.

Research Commercialization

The μEP graduate program includes specific required coursework and training in both project management and research commercialization. Graduates from this program are well equipped to start up their own company based on their own research or to become early stage technology intrapreneurs in large multinational corporations driving product development.



PhD student, Tim Morgan, in MBE Lab Courtesy of Chen Li

μEP Faculty

Professor

Simon Ang
 Juan C. Balda
 Salvador Barraza-Lopez
 Mourad Benamara
 Robert Beitle, Jr.
 Laurent Bellaiche
 Hassan Beyzavi
 Jingyi Chen
 Zhong Chen
 Hugh Churchill
 Robert Coridan

Department

Electrical Engineering
 Electrical Engineering
 Physics
 Physics
 Chemical Engineering
 Physics
 Chemistry/Biochemistry
 Chemistry/Biochemistry
 Electrical Engineering
 Physics
 Chemistry/Biochemistry

Russell DePriest	Adjunct Faculty
Jia Di	Comp Science/Comp Eng
Magda El-Shenawee	Electrical Engineering
Ingrid Fritsch	Chemistry/Biochemistry
Huaxiang Fu	Physics
Lauren Greenlee	Chemical Engineering
William Harter	Physics
Colin Heyes	Chemistry/Biochemistry
Jamie Hestekin	Chemical Engineering
Adam Huang	Mechanical Engineering
David Huitink	Mechanical Engineering
Morten Jensen	Biomedical Engineering
Jin-Woo Kim	Biological/Agricultural Engineering
Pradeep Kumar	Physics
Matt Leftwich	Chemical Engineering
Jiali Li	Physics
Yanbin Li	Biological/Agricultural Engineering
Alex Lostetter	Adjunct Faculty
Ajay Malshe	Mechanical Engineering
Bothina Manasreh	Physics
Omar Manasreh	Electrical Engineering
Alan Mantooth	Electrical Engineering
Roy McCann	Electrical Engineering
Paul Millett	Mechanical Engineering
Mahmoud Moradi	Chemistry/Biochemistry
Timothy Muldoon	Biomedical Engineering
Arun Nair	Mechanical Engineering
Hameed Naseem	Electrical Engineering
William Oliver, III	Physics
Ed Pohl	Industrial Engineering
Errol Porter	Electrical Engineering
Greg Salamo	Physics
Surendra Singh	Physics
Panneer Selvam	Civil Engineering
Shannon Servoss	Chemical Engineering
Ranil Wickramasinghe	Chemical Engineering
Woodrow Shew	Physics
Julie Stenken	Chemistry/Biochemistry
Zhengrong Tian	Chemistry/Biochemistry
Steve Tung	Mechanical Engineering
Ken Vickers	Adjunct Faculty
Yong Wang	Physics
Morgan Ware	Electrical Engineering
Uche Wejinya	Mechanical Engineering
Jie Xiao	Chemistry/Biochemistry
Min Xiao	Physics
Fisher Yu	Electrical Engineering
Wenchao Zhou	Mechanical Engineering
Min Zou	Mechanical Engineering

For more information about the μEP Graduate Program, please contact:

Dr. Rick Wise, Director
 731 West Dickson Street
 NANO 104
 Fayetteville, Arkansas 72701
 Phone: (479) 575-3175
 Email: microEP@uark.edu
<http://microelectronics-photonics.uark.edu/>