

ADELE TAMBOLI

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EDUCATION

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Ph.D., Advisor: Evelyn Hu
Expected graduation: Spring 2009

HARVEY MUDD COLLEGE, CLAREMONT, CA
B.S., Advisors: James Eckert & Patricia Sparks
Graduated with honors, June 2004

RESEARCH EXPERIENCE

UNIVERSITY OF CALIFORNIA, SANTA BARBARA
Ph.D., Advisor: Evelyn Hu 2004-2009
Explored design and processing techniques for the fabrication and characterization of GaN/ InGaN microdisk lasers, including photoelectrochemical (PEC) etching. Achieved record low threshold for optically pumped microcavity lasing in the GaN/ InGaN system. Progress towards electrically injected GaN microdisks and nonpolar m-plane microdisks. Discovered a method to PEC etch p-type GaN heterostructures.

HARVEY MUDD COLLEGE, CLAREMONT, CA
BS, Advisors: James Eckert & Patricia Sparks 2000-2004
Used modified spin valve structures to measure the spin-dependent mean free path in several metals. Determined the temperature dependence of the spin-dependent mean free path in Cu and CoFe as a result of these measurements.

NATIONAL NANOFABRICATION USERS NETWORK, UCSB
Undergraduate Intern, Advisor: Frank Brown 2003
Used a solvent-free cell membrane simulation to measure the bending rigidity of membranes as a function of amphiphile aspect ratio. Studied membranes with mixtures of amphiphile sizes and inclusions.

LOS ALAMOS NATIONAL LABORATORY
Undergraduate Intern, Advisor: Robert McQueeney 2001
Developed an automatic calibration routine for PHAROS, a position-sensitive neutron spectrometer that measures inelastic neutron scattering. Helped rebuild the spectrometer for use by university and industry scientists.

NANOFABRICATION

Photoelectrochemical etching of semiconductors
Extensive semiconductor processing experience, including lithography (contact and projection), electron beam and thermal evaporation of metals, annealing (including ohmic contacts), dry etching (RIE, ICP), plasma enhanced chemical vapor deposition, sputter deposition, and photomask design (L-Edit) and fabrication.

CHARACTERIZATION

Scanning Electron Microscopy, Atomic Force Microscopy, and photoluminescence
Electrical testing, electroluminescence, and microphotoluminescence of optical and optoelectronic devices

MATERIALS

Experience with GaN, GaAs, and Si based devices.

HONORS

American Society for Engineering Education graduate fellowship recipient
National Science Foundation graduate fellowship honorable mention
National Science Foundation IGERT program graduate fellowship recipient
Graduation “with distinction” from Harvey Mudd College
Focke Award for best experimental thesis, Physics Department, Harvey Mudd College

PATENTS

A. C. Tamboli, E. L. Hu, J. S. Speck, *Photoelectrochemical etching for chip shaping of light emitting diodes*. Submitted to UC Patent Office.

A. C. Tamboli, E. L. Hu, S. P. DenBaars, S. Nakamura, *Photoelectrochemical roughening of Ga-face, p-side-up GaN-based light emitting diodes*. Patent pending, UC Case #2008-535.

A. C. Tamboli, E. L. Hu, M. C. Schmidt, S. Nakamura, S. P. DenBaars, *Photoelectrochemical etching of p-type semiconductor heterostructures*. Patent pending, UC Case #2008-533.

PUBLICATIONS

A. C. Tamboli, K. C. McGroddy, E. L. Hu, *Photoelectrochemical roughening of p-GaN for light extraction from GaN/InGaN light emitting diodes*. Accepted, *Physica Status Solidi (c)*.

A. C. Tamboli, M. C. Schmidt, S. Rajan, J. S. Speck, U. K. Mishra, S. P. DenBaars, E. L. Hu, *Smooth top-down photoelectrochemical etching of m-plane GaN*. Accepted, *Journal of the Electrochemical Society*.

A. C. Tamboli, E. D. Haberer, R. Sharma, K. H. Lee, S. Nakamura, E. L. Hu, *Room-Temperature continuous-wave lasing in GaN/InGaN microdisks*. *Nature Photonics* **1**, 61 (2007)

K. Hennessy, A. Badolato, **A. Tamboli**, P. M. Petroff, E. Hu, M. Atatüre, J. Dreiser, A. Imamoglu, *Tuning photonic crystal nanocavity modes by wet chemical digital etching*, *Appl. Phys. Lett.* **87**, 021108 (2005)

K. F. Shakespear, K. L. Perdue, S. M. Moyerman, J. G. Checkelsky, S. S. Harberger, **A. C. Tamboli**, M. J. Carey, P. D. Sparks, J. D. Eckert, *Determining the spin dependent mean free path in $Co_{90}Fe_{10}$ using giant magnetoresistance*, *J. Appl. Phys.* **97** 10C513 (2005)

G. Brannigan, **A. C. Tamboli**, F. L. H. Brown, *The role of molecular shape in bilayer elasticity and phase behavior*, *J. Chem. Phys.* **121** 3259 (2004)

CONFERENCES

A. C. Tamboli, M.C. Schmidt, K. McGroddy, S.P. DenBaars, S. Nakamura, and E.L. Hu, *Photoelectrochemical etching of GaN for high quality electronic and optical devices*, 50th Anniversary Electronic Materials Conference, Santa Barbara, CA, June 25-27 2008.

A. C. Tamboli, M. C. Schmidt, E. D. Haberer, K. C. Kim, J. S. Speck, S. P. DenBaars, S. Nakamura, E. L. Hu, *Photoelectrochemical etching of m-plane GaN for smooth, low damage etching of optical devices*, 7th International Conference of Nitride Semiconductors, Las Vegas, NV, Sept. 16- 21 2007.

A. C. Tamboli, E. D. Haberer, R. Sharma, K. H. Lee, S. Nakamura, E. L. Hu, *Optical properties of GaN microdisks fabricated by photoelectrochemical etching*, Fourth International School and Conference on Spintronics and Quantum Information Technology, Maui, HI, June 17-22 2007.

A. C. Tamboli, E. D. Haberer, R. Sharma, K. H. Lee, S. Nakamura, E. L. Hu, *GaN microdisks: optical properties and low-threshold lasing*, Materials Research Society Fall Meeting, Boston, MA, Nov. 27- Dec. 1 2006.

A. C. Tamboli, E. D. Haberer, R. Sharma, K. H. Lee, S. Nakamura, E. L. Hu, *Optical properties of GaN microdisks fabricated using photoelectrochemical etching*, International Workshop on Nitride Semiconductors, Kyoto, Japan, Oct. 23-27 2006.

A. C. Tamboli, J. G. Checkelsky, M. J. Carey, P. D. Sparks, J. C. Eckert, *Temperature dependence of spin dependent mean free path in backed spin valve structures*, 5th International Symposium on Metallic Multilayers, Boulder, CO, June 7-11 2004.

A. C. Tamboli, J. G. Checkelsky, M. J. Carey, P. D. Sparks, J. C. Eckert, *Temperature dependence of spin dependent mean free path in backed spin valve structures*, American Physical Society March Meeting, Montreal, Québec, March 22-26 2004.

TEACHING EXPERIENCE

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Mentor to undergraduate student 2008
Mentored an undergraduate student for six months, including developing a project, training on laboratory equipment, and teaching fundamentals of semiconductor devices and processing.

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

Teaching Assistant, Matrl 215A/ ECE 220A 2007
Held office hours, helped with homework and laboratory processes, and graded homework assignments for Matrl 215A/ECE 220A, the laboratory-based graduate-level introduction to semiconductor processing course. Students in this course learned to fabricate silicon transistors.

Teaching Assistant, Matrl 200B 2006
Assisted students with homework and course material and graded assignments for Matrl 200B, the lecture-based introductory graduate course in solid state physics for the Materials Department.

HARVEY MUDD COLLEGE, CLAREMONT, CA

Tutor, various Physics courses 2001-2002
Graded homework and tutored students for undergraduate Physics courses in classical mechanics, special relativity, and electricity and magnetism.