

KATHRYN A. MINDER

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RESEARCH INTERESTS

| | |
|-----------------------------|--------------------------|
| Optoelectronics | Device Testing |
| Device Design | Semiconductor Processing |
| III-Nitride Material System | |

EDUCATION

Ph.D. candidate in Electrical Engineering, Northwestern University
Expected Graduation June 2007
Dissertation Title: AlGaN Deep UV Optoelectronic Devices: Device Design, Fabrication and Characterization
Overall GPA: 3.818 / 4.000

B.S. in Electrical Engineering, Northwestern University, 2002
Overall GPA: 3.545 / 4.000

Electrical Engineering Student, Penn State University, 1998-1999
Overall GPA: 3.67 / 4.00

RESEARCH EXPERIENCE

Research Assistant, Center for Quantum Devices, Northwestern University, 2002-present

- Specializing in III-Nitride semiconductor device processing and characterization
- Continuously work to optimize the fabrication of III-Nitride based optoelectronic devices
- Processed and hybridized the CQD's solar-blind Focal Plane Array
- Processed the CQD's record high power 280 nm, 265 nm, and 250 nm UV LEDs
- Processed the CQD's record high quantum efficiency solar blind photodetector
- Collaborated with Nanovation SARL to develop processing procedure for ZnO devices
- Worked with other graduate students to maintain, troubleshoot, and repair CQD equipment

TEACHING EXPERIENCE

Mentor, Center for Quantum Devices, Northwestern University, 2002-present

- Taught visiting undergraduate interns semiconductor processing
- Worked with Northwestern University undergrads for their independent study courses
- Mentored incoming graduate students

INDUSTRIAL EXPERIENCE

Contract Developer, Bluecoat Systems, 2006

- Assisted in the development of a dynamically created web page of network statistics using data from an existing security appliance, identified by Bluecoat to be a major hole in their appliance feature set
- Given ownership of the Perl script portion of the project
- Fixed bugs identified by QA

Senior Developer, Edward-Scott, 2004-2005

- Designed and implemented a facilities management web site for the State of Illinois
- Built the back end coding and designed the database for CrystalClearEnglish.com, which included shopsite integration for online purchasing, user registration, login / logout, file upload / download, and administrative functionalities.

Intern - Systems Integration and Testing, Motorola, Winter and Summer 2001

- Built and maintained web page for current software version reference
- Worked with a team to build and test a new version of Motorola's Radio Network System
- Given ownership of Base Stations and DIUs
- Assisted in system integration and system testing

Intern - Software Developer, Cherry Electrical Products, Summer 2000

- Researched, proposed, designed and implemented organizational system for intra-office engineering documentation based on Visual Basic and Visual Basic for Applications
- Gave presentations for the proposed design and finished product to department and related supervisors
- Gave weekly progress presentations at departmental meetings

COMPUTER SKILLS

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|---------------------------------|------------------------------------|
| Operating Systems: | Unix / Linux, Mac OSX, Windows |
| Computer Languages: | Perl, PHP, C++, Visual Basic / VBA |
| Scientific Applications: | Origin / OriginLab Coding |
| Technical Drawing: | AutoCAD, Microsoft Visio |
| Office Applications: | Microsoft PowerPoint, Excel, Word |
| Internet Development: | PHP, HTML, XML |
| Database: | postgreSQL |

AWARDS

- Motorola Fellowship (2003-present)
- Walter P. Murphy Fellowship (2002-2003)
- On Dean's List and Completed Coursework with Honors, Fall Quarter 2000
- On Dean's List at Penn State for all three semesters
- Awarded National Scholarship for Army ROTC

AFFILIATIONS

- Member of the Institute of Electrical and Electronics Engineers (IEEE)
- Member of Eta Kappa Nu, Electrical Engineering National Honor Society
- Member of the National Society of Collegiate Scholars

PUBLICATIONS

- D. J. Rogers, F. H. Teherani, A. Yasan, **K. Minder**, P. Kung, and M. Razeghi, "375 nm electroluminescence from a ZnO / GaN:Mg / c-Al₂O₃ heterojunction light-emitting diode," *Appl. Phys. Lett.* **88**, 141918 (2006).
- R. McClintock, **K. Minder**, A. Yasan, C. Bayram, F. Fuchs, P. Kung, and M. Razeghi, "Solar-blind avalanche photodiodes," *Proc. SPIE* (2006).
- D. J. Rogers, F. H. Teherani, A. Yasan, **K. Mayes**, P. Kung, and M. Razeghi, "Development of UV LEDs based on epitaxial ZnO grown by pulsed laser deposition," *Proc. SPIE* (2006).
- R. McClintock, A. Yasan, **K. Minder**, P. Kung, and M. Razeghi, "Avalanche multiplication in AlGaIn based solar-blind photodetectors," *Appl. Phys. Lett.* **87**, 241123 (2005).
- D. J. Rogers, F. H. Teherani, A. Yasan, R. P. McClintock, **K. Mayes**, S. R. Darvish, P. Kung, M. Razeghi, and G. Garry, "ZnO thin film templates for GaN-based devices," *Proc. SPIE* **5732**, 412 (2005).
- A. Yasan, R. McClintock, **K. Mayes**, P. Kung, and M. Razeghi, "AlGaIn-based deep UV light emitting diodes with peak emission below 255 nm," *Proc. SPIE* **5732**, 197 (2005).
- R. McClintock, A. Yasan, **K. Mayes**, P. Kung, and M. Razeghi, "Back-illuminated solar-blind photodetectors for imaging applications," *Proc. SPIE* **5732**, 175 (2005).
- R. McClintock, **K. Mayes**, A. Yasan, D. Shiell, P. Kung, and M. Razeghi, "320x256 solar-blind focal plane arrays based on Al_xGa_{1-x}N," *Appl. Phys. Lett.* **86**, 011117 (2005).
- R. McClintock, A. Yasan, **K. A. Mayes**, D. J. Shiell, S. R. Darvish, P. Kung, and M. Razeghi, "High-quantum-efficiency solar-blind photodetectors," *Proc. SPIE* **5359**, 434 (2004).
- A. Yasan, R. McClintock, **K. A. Mayes**, D. J. Shiell, S. R. Darvish, P. Kung, and M. Razeghi, "Growth of deep-UV light-emitting diodes by metalorganic chemical vapor deposition," *Proc. SPIE* **5359**, 400 (2004).
- R. McClintock, A. Yasan, **K. Mayes**, D. Shiell, S. R. Darvish, P. Kung, and M. Razeghi, "High quantum efficiency AlGaIn solar-blind *p-I-n* photodiodes," *Appl. Phys. Lett.* **84**, 1248 (2004).
- **K. Mayes**, A. Yasan, R. McClintock, D. Shiell, S. R. Darvish, P. Kung, and M. Razeghi, "High-power 280 nm AlGaIn light-emitting diodes based on an asymmetric single-quantum well," *Appl. Phys. Lett.* **84**, 1046 (2004).
- M. Razeghi, A. Yasan, R. McClintock, **K. Mayes**, D. Shiell, S. R. Darvish, and P. Kung, "Review of III-nitride optoelectronic materials for light emission and detection," *Phys. Stat. Sol. (c)* **1**, s141 (2004).
- A. Yasan, R. McClintock, **K. Mayes**, D. Shiell, L. Gautero, S. R. Darvish, P. Kung, and M. Razeghi, "4.5 mW operation of AlGaIn-based 267 nm deep-ultraviolet light-emitting diodes," *Appl. Phys. Lett.* **83**, 4701 (2003).
- A. Yasan, R. McClintock, **K. Mayes**, D. H. Kim, P. Kung, and M. Razeghi, "Photoluminescence study of AlGaIn-based 280 nm ultraviolet light-emitting diodes," *Appl. Phys. Lett.* **83**, 4083 (2003).

PUBLICATIONS

- A. Yasan, R. McClintock, **K. Mayes**, S. R. Darvish, H. Zhang, P. Kung, M. Razeghi, S. K. Lee, and J. Han, "Comparison of ultraviolet light-emitting diodes with peak emission at 340 nm grown on GaN substrate and sapphire," Appl. Phys. Lett. **81**, 2151 (2002).
- A. Yssan, R. McClintock, **K. Mayes**, S. R. Darvish, P. Kung, and M. Razeghi, "Top-emission ultraviolet light-emitting diodes with peak emission at 280 nm," Appl. Phys. Lett **81**, 801 (2002).
- A. Yasan, R. McClintock, **K. Mayes**, S. R. Darvish, P. Kung, M. Razeghi, and R. J. Molnar, "280 nm UV LEDs grown on HVPE GaN substrates,," Opto-electronics review **10**, 287 (2002).

PRESENTATIONS

- **K. Minder**, "Wide Bandgap III-Nitride Semiconductors for Light Emitters and Photodetectors," SABA Technical Review Meeting, San Francisco, California, November 4, 2005.

HIGHLIGHTS OF QUALIFICATIONS

- Know semiconductor processing fundamentals such as **sample cleaning, photolithography, dry and wet etching techniques, metal evaporation, dielectric deposition, and rapid thermal annealing.**
- Understand **device characterization techniques.**
- Worked to **optimize the processing** of III-Nitride based devices.
- Demonstrated leadership in the **demanding environment** of the Center for Quantum Devices.
- A **key player in a tight knit team** for III-nitride research that addresses all aspects of the project from material growth and characterization to device fabrication and testing to systems development.
- **Mentor** to summer interns, graduate students, and undergraduate students in the lab environment.
- Completed several independent programming projects in my spare through **self-discipline.**
- **Self-taught** new programming languages as needed for various coding projects, including Perl, PHP, and Visual Basic / VBA.
- Worked in a **team environment** at Motorola for system integration and system testing of a new version of Motorola's Radio Network System.
- **Given ownership** of the base-stations and DIUs of the radio network system at Motorola.
- **Independently researched, designed, proposed, and implemented** an intra-office engineering documentation system at Cherry Electrical Products during a summer internship.
- **Kept communication open** during the documentation system project through weekly progress presentations and feedback sessions with the engineers at Cherry Electrical Products.

RELEVANT COURSES

Ph.D. Courses:

- Optoelectronics
- Advanced Photonics
- Quantum Devices
- Solid State Electronic Devices
- Fiber Optic Communications
- Crystallography
- Introduction to MEMS
- Superconductor Applications
- Nanomaterials
- Quantum Semiconductors
- Thin Film Materials
- Intro to Electron Microscopy
- Advanced Electronic Devices

Previous Courses:

- Microelectronic Technologies
- Fundamentals of Electronic Devices
- Survey of Modern Physics
- Digital Communications
- Feedback Systems
- Probability of Random Signals
- Electronic Materials
- Fundamentals of Solid State Engineering
- Signals and Systems
- Circuits
- Digital Logic Design
- Introduction to Computer Programming
- Electromagnetics and Photonics
- Econ and Finance for Engineers
- Lasers and Coherent Optics
- Intro to Communication Networks
- Digital Electronic Circuit Systems
- Communications
- Digital Signal Processing
- Thermodynamics
- Engineering Design and Communication
- Fundamentals of Electromagnetics and Photonics