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### **EDUCATION**

- B.M.E. Mechanical Engineering, University of Delaware, Newark, Delaware 2002
- A.A.S. Mechanical Engineering Technology, Delaware Technical and Community College, Stanton, Delaware 1997
- B.A. Physics, Frostburg State University, Frostburg, Maryland 1991

### **STATE REGISTERED**

Professional Engineer, Delaware License #15527

### **EXPERIENCE**

2004–present Research Associate I, Institute of Energy Conversion, University of Delaware, Newark, Delaware 19716

- Fabricate thin film solar modules.
- Design and build highly specialized vacuum systems and other laboratory equipment. Instruct research staff and students on use of this equipment.
- Perform engineering design and construction of components used in vacuum deposition systems utilizing when necessary specialized design software.
- Supervise machine shop, maintain equipment, and train users.

2000.2004 Senior Research Technician, Institute of Energy Conversion, University of Delaware, Newark, Delaware 19716

1995.2000 Research Technician, Institute of Energy Conversion, University of Delaware, Newark, Delaware 19716

1992.1995 Lab Technician, Institute of Energy Conversion, University of Delaware, Newark, Delaware 19716

## PROFESSIONAL SOCIETIES

- American Society of Mechanical Engineers
- Delaware Association of Professional Engineers
- Society of Vacuum Coaters

## PATENTS

PCT Application 60/620,352 dated 2004, "Formation of Selenide, Sulfide or Mixed Selenide-Sulfide Films on Metal or Metal Coated Substrates," Inventors: E. Eser, S. Fields.

## PUBLICATIONS

1. "Vapor Transport Deposition of Cadmium Telluride Films," Brian E. McCandless, Robert W. Birkmire, Wayne A. Buchanan, Shannon Fields, Gregory M. Hanket, Proc. 29<sup>th</sup> IEEE PVSC, 547 (2002).
2. "Processing Improvements for Roll-to-Roll Deposition of Cu(InGa)Se<sub>2</sub>," E. Eser, S. Fields, G. Hanket, R.W. Birkmire, W. Shafarman, Prog. Rev **32**, (2004).
3. "Critical Issues in Vapor Deposition of Cu(InGa)Se<sub>2</sub> on Polymer Web: Source Spitting and Back Contact Cracking," Erten Eser, Shannon Fields, Gregory Hanket, Robert W. Birkmire, Jeffrey Doody, Proc. 31<sup>st</sup> IEEE PVSC, 515 (2005).
4. "Critical Issues for Cu(InGa)Se<sub>2</sub> Solar Cells on Flexible Polymer Web," Erten Eser, Shannon Fields, William Shafarman, Robert Birkmire, submitted to the 19<sup>th</sup> Space Photovoltaic Research and Technology Conference (SPRAT XIX), Sept. 2005.
5. "Design Strategy for Scale-Up of Physical Vapor Deposition of Cu(InGa)Se<sub>2</sub> on Flexible Substrates," Kapil Mukati, Babatunde A. Ogunnaike, Erten Eser, Shannon Fields, Robert W. Birkmire, submitted to WCPEC-4, May 2006.
6. "Design of a Vapor Transport Deposition Process for Thin Film Materials," G.M. Hanket, B.E. McCandless, W.A. Buchanan, S. Fields, R.W. Birkmire, submitted 2/9/06 to Journal of Vacuum Science and Technology A. accepted 5/8/06 manuscript #30546 to be published Sept/Oct 2006 AIP ID #002605JV.