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#### EDUCATION

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*Virginia Polytechnic Institute and State University, Blacksburg, VA*  
**Ph.D. in Electrical Engineering** **2006**  
Dissertation: "Electrochemical Characterization for Electric Utility Applications"

*New Mexico State University, Las Cruces, NM*  
**M.S. in Electrical Engineering** **1995**  
Thesis: "Disturbance Detection using Wavelets"

*New Mexico State University, Las Cruces, NM*  
**B.S. in Electrical Engineering** **1993**  
Areas of Concentration: Power electronics and power engineering

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#### AWARDS

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- Presidential Early Career Award for Scientist & Engineers (PECASE) **2012**
- Sandia's Up-and-Coming Innovator Award for Center 6100 **2011**
- R&D 100 Award – Ultra-high-voltage Silicon-Carbide (SiC) Thyristor **2011**
- R&D 100 Award – High Temperature SiC Power Module **2009**
- R&D 100 Award – Emitter Turn Off Thyristor **2003**
- R&D 100 Award – Fiber Optic Current Sensor **2003**
- 2006 IEEE Power Engineering Education Committee Prize Paper Award **2006**
- American Indian Science & Engineering Society Technical Excellence Award **2007**

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#### PROFESSIONAL EXPERIENCE

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*Sandia National Laboratories, Albuquerque, NM*  
**Power Electronics and Energy Storage** **1997-Present**  
Technically directs and manage the DOE Energy Storage Power Electronics Program which focuses on reducing cost, increasing reliability, and increasing performance of power conversion systems rated from 5 kW to 10s of MW including silicon and post-silicon based systems for energy storage applications. Power electronics and energy storage technology integration consultant to the DOE Energy Storage Program, private industry, and universities as well as other DOE programs (EERE and ARPA-E). Applications include Distributed Energy Resources system integration including advanced energy storage technologies such as electrochemical capacitors and renewable energy such as wind and PV. Simulated various energy storage technology integration using PSCAD, PSPICE, and MATLAB. Developed electrical models for electrochemical capacitors and advanced battery systems for electric utility, transportation, and weapon system applications. Developed advanced control methodologies for energy storage integration to increase round-trip efficiency, cycle life, and energy utilization.

**Power Electronics and Custom Controllers** **1995-1997**  
Characterized timers and custom controllers for various nuclear weapon systems. Completed a 2-year intense Weapon Internship Program at Sandia. Knowledge in the area of overall weapon system requirements for B61, W76, and W80 including energy storage and power electronics. Provide thermal battery and power electronics integration consulting for weapon systems. Provided dynamic simulation of thermal batteries using PSPICE simulation software while under test to understand and provided recommendations for multiple battery interactions.

Managed, directed, and installed electric monitoring systems plus communication hardware for the Sandia's electric utility feeders to enhance load management strategies and increase knowledge of load flow studies for the laboratories. Performed signal processing and Fourier transforms of harmonic signals injected by power-electronic-based motor drives and provided recommendations on how to minimize harmonic impacts on motors. Performed technical research and provided a technical seminar on harmonics issues related to motor drives systems located at Sandia.

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**PUBLICATIONS AND PAPERS**

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- S. DasGupta, M. Sun, A. Armstrong, R. Kaplar, M. Marinella, J. Stanley, S. Atcitty, and T. Palacios, "Impact of the Al mole fraction on the Bulk- and Surface-State-Induced Instability of AlGaIn/GaN HEMTs", Material Research Society Spring Meeting, April 2012.
  - S. DasGupta, M. Sun, A. Armstrong, R. Kaplar, M. Marinella, J. Stanley, S. Atcitty, and T. Palacios, "Slow Detrapping Transients due to Gate and Drain Bias in High Breakdown Voltage AlGaIn/GaN HEMTs", IEEE Transactions on Electron Devices, 2012.
  - R. Kaplar, M. Marinella, S. DasGupta, M. Smith, S. Atcitty, M. Sun, and T. Palacios, "Characterization and Reliability for SiC- and GaN-Based Power Transistor for Renewable Energy Applications", IEEE Energy Tech, May 2012.
  - S. Atcitty, R. Kaplar, S. DasGupta, M. Marinella, M. Smith, M. Sun, and T. Palacios, "Wide-Bandgap Power Switch Reliability for Energy Storage and Grid Applications", Advanced Microgrid Concepts and Technology Workshop, Beltsville, MD, June 2012.
  - D. Fregosi, S. Atcitty, Subhashish Bhattacharya, "Empirical Battery Model Characterizing a Utility-Scale Carbon-Enhanced VRLA Battery", 2011 IEEE ECCE, September 17-22, 2011, Phoenix, Arizona.
  - S. Atcitty, J. Granata, M. Quintana, C. Tasca, "Utility-Scale Grid-Tied PV Inverter Reliability Workshop Summary Report", SAND2011-4778, July 2011.
  - M. Marinella, S. Atcitty, S. DasGupta, R. Kaplar, M. Smith, "High Power Semiconductor Devices for FACTS: Current State of the Art and Opportunities for Advanced Materials", Electrochemical Society Meeting and Electrochemical Energy Summit, October 10, 2011.
  - S. DasGupta, M. Marinella, R. Kaplar, R. Brock, M. Smith, S. Atcitty, "Reliability Evaluation and Prediction of Commercial 4H-SiC Power MOSFETs", 6<sup>th</sup> Annual SiC MOS Workshop University of Maryland College Park, August 18, 2011.
  - S. DasGupta, M. Marinella, R. Kaplar, R. Brock, M. Smith, S. Atcitty, "Sub-bandgap light-induced carrier generation at room temperature in Silicon Carbide MOS capacitors", International Conference on Silicon Carbide and Related Materials, September 11-16, 2011.
  - R. Kaplar, S. DasGupta, M. Marinella, M. Smith, S. Atcitty, "Degradation Mechanisms and Characterization Techniques in SiC MOSFETs at High Temperature Operation", Electrical Energy Storage Applications and Technologies, Oct. 17-19, 2011.
  - S. DasGupta, R. Brock, R. Kaplar, M. Marinella, M. Smith, S. Atcitty, "Extraction of trapped charge in 4 H-SiC metal oxide semiconductor field effect transistors from subthreshold characteristics", Applied Physics Letters 99, July 15, 2011.
  - F. Maldonado, S. Atcitty, J. Henfling, "Enhanced High Temperature Power Controller", International Conference and Exhibition on High Temperature Electronics Network (HiTEN), July 18-21, 2011, Oxford, United Kingdom.
  - K. Wang, M. Crow, B. McMillin, S. Atcitty, "A Novel Real-Time Approach to Unified Power Flow Controller Validation," IEEE Transactions on Power Systems, vol. 25, no. 4, November 2010.
  - M. Zarghami, M. Crow, S. Jagannathan, Y. Liu, Stan Atcitty, "A Novel Approach to Inter-Area Oscillation Damping by Unified Power Flow Controllers Utilizing Ultracapacitors," IEEE Trans. On Power Systems, vol. 25, February 1, 2010.
  - J. Henfling, F. Maldonado, S. Atcitty, "Development of an Integrated Power Controller Based on SOI and SiC", International Conference and Exhibition on High Temperature Electronics Network (HiTEN), September 13-16, 2009, Oxford, United Kingdom.
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- W. Siever, D. Tauritz, A. Miller, B. McMillin, M. Crow, Stan Atcitty, "Symbolic Reduction for High-Speed Power System Simulation", *Simulations: Transactions of the Society for Modeling and Simulations International*, vol. 84, no. 6, June 2008.
  - M. Baran, S. Teleke, A. Huang, S. Bhattacharya, L. Anderson, S. Atcitty, "Dispatching of Wind Farms Using Battery Energy Storage", *International Journal of Power Electronics*, Vol. 1, No. 2, pp. 164-175, 2008.
  - M. Crow, B. McMillin, S. Atcitty, "Cyber-Physical Systems Distributed Control: The Advanced Electric Power Grid", *Proceedings of the 2007 Electrical Energy Storage Applications and Technologies*, San Francisco, September 2007.
  - M. Buran, S. Teleke, A. Huang, S. Bhattacharya, L. Anderson, S. Atcitty, "STATCOM with Energy Storage to Smooth out Intermittent Power Output of Wind Farms", *EESAT 2007*.
  - B. Zhang, A. Huang, B. Chen, S. Atcitty, M. Ingram, "Development and Experimental Demonstration of a Self-Powered ETO (SPETO)", *IEEE Trans. On Industry Applications*, Vol. 42, No. 6, pp. 1387-1394, November/December 2006.
  - A. Huang, B. Chen, C. Han, Z. Du, S. Bhattacharya, M. Baran, A. Edris, S. Atcitty, M. Ingram, "Emitter Turn-Off (ETO) Thyristor: An Emerging Power Semiconductor Switch with Lower Cost, Improved Reliability and Scalability for Next Generation FACTS-Controller", *CIGRE 2006*, paper B4-107.
  - Y. Cheng, C. Qian, M. Crow, S. Pekarek, S. Atcitty, "A Comparison of Diode-Clamped and Cascaded Multilevel Converters for a STATCOM with Energy Storage", *IEEE Transactions on Industrial Electronics*, vol. 53, no. 5, October 2006.
  - B. Chen, A. Huang, S. Atcitty, "Control Power Self Generation and Sensor Integration in Emitter Turn-off Thyristor (ETO)", *Proceedings of 2006 IEEE IAS Annual Meeting*, October 8-12, Tampa, Florida.
  - K. Kook, K. McKenzie, Y. Liu, S. Atcitty, "A Study on Applications of Energy Storage for the Wind Power Operation in Power Systems", *2006 PES General Meeting*, June 18-22 2006 in Montreal, Quebec, Canada.
  - C. Han, A. Huang, H., Kamath, M., Ingram, S., Atcitty, "Modeling and Design of a Transmission Ultracapacitor (TUCAP) Integrating Modular Voltage Source Converter with Ultracapacitor Energy Storage", *Applied Power Electronics Conference and Exposition, 2006, APEC, 2006, Twentieth Annual IEEE 19-23 March 2006*.
  - M. Crow, B. McMillin, S. Atcitty, "An Approach to Improving the Physical and Cyber Security of a Bulk Power System with FACTS", *Proceedings of the Electrical Energy Storage Applications and Technologies Conference*, San Francisco, California, October 2005.
  - B. Chen, N. Zhu, Y. Gao, A. Huang, S. Atcitty, "Performance of a 4.5 kV, 100 A Current-Scalable Emitter Turn-off (ETO) Thyristor Module", *Proceedings of 35<sup>th</sup> IAS Annual Meeting*, 2005.
  - L. Zhang, C. Shen, M. Crow, S. Atcitty, L. Dong, S. Pekarek, "Performance Indices for the Dynamic Performance of FACTS and FACTS with Energy Storage", *Electric Power System Components and Systems*, vol. 33, no. 3, March 2005.
  - S. Atcitty, D., Ingersoll, "Electrochemical Capacitor Modeling for Electric Utility Applications", *The 15th International Seminar on Double Layer Capacitors and Hybrid Energy Storage Devices*, Deerfield Beach, Florida, December 6, 2005.
  - C. Han, A. Huang, A., H., Kamath, M., Ingram, S., Atcitty, "Progress on a Transmission Ultracapacitor Integrating Emitter Turn-Off Thyristor with Ultracapacitor", *Proceedings of the Electrical Energy Storage Systems Applications and Technologies*, San Francisco, California, October 17-19, 2005.
  - B. Zhang, A. Huang, B. Chen, S. Atcitty, M. Ingram, "SPETO: A Superior Power Switch for High Power, High Frequency, Low Cost Converters", *Proceedings of 34<sup>th</sup> IAS Annual Meeting*, 2004.
  - L. Dong, M. Crow, Z. Yang, S. Atcitty, "A Reconfigurable FACTS Systems for University Laboratories", *IEEE Transactions on Power Systems*, vol. 19, no. 1, pp. 120-128, February 2004.
  - S. J., Ranade, X., Jiang, L. D., Terala, "Enhancing The Transient Loadability Of Distributed Generation Using An Electro-Chemical, Capacitor-Based Energy Storage System", *Proceedings of*
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the Electrical Energy Storage Systems Applications and Technologies, San Francisco, California, October 2003.

- Y. Cheng, C. Qian M. Crow, S. Atcitty, "Efficient Utilization of Battery Energy Storage in a Multilevel Converter StatCom", Proceedings of the Electrical Energy Storage Applications and Technologies Conference, San Francisco, California, October 2003.
- B. Zhang, A. Huang, X. Zhou, Y. Liu, S. Atcitty, "The Built-in Current Sensor and Over-current Protection of the Emitter Turn-off (ETO) Thyristor", Industry Applications Conference 2003, 38<sup>th</sup> IAS Annual Meeting, Vol. 2, pp. 1264-1269.
- B. Zhang, A. Huang, Y. Liu, S. Atcitty, "Performance of the Next Generation Emitter Turn-off (ETO) Thyristor", 37<sup>th</sup> IAS Annual Meeting, Vol. 1, pp. 559-563, Pittsburgh, Pennsylvania, October 2002.
- Z. Yang, C. Shen, L. Zhang, M. L. Crow, S. Atcitty, "Integration of a StatCom and Battery Energy Storage", *IEEE Transactions on Power Systems*, vol. 16, no. 2, pp. 254-260, May 2001.
- C. Qian, L. Zhang, C. Shen, M. Crow, S. Atcitty, "A Comparison of FACTS Devices Integrated with Battery Energy Storage Systems", Proceedings of the 2001 IEEE PES Transmission and Distribution Conference and Expo, Atlanta, Georgia, October 2001.
- L. Zhang, C. Shen, M. Crow, L. Dong, S. Atcitty, "A Comparison of the Dynamic Performance of an SSSC to an SSSC with Battery Energy Storage," Proceedings of the North American Power Symposium, Texas A&M University, October 2001.
- L. Zhang, C. Shen, Z. Yang, M. Crow, A. Arsoy, Y. Liu, S. Atcitty, "A Comparison of the Dynamic Performance of FACTS with Energy Storage to a Unified Power Flow Controller", Proceedings of the IEEE Power Engineering Society 2001 Winter Meeting, Columbus, Ohio, January 2001.
- C. Shen, Z. Yang, M. Crow, S. Atcitty, "Control of a StatCom with Energy Storage Device", Proceedings of the IEEE Power Engineering Society 2000 Winter Meeting, Singapore, January 2000.
- S. Atcitty, S. Ranade, A. Gray-Fenner, "Summary of the State-of-the-Art Power Conversion Systems for Energy Storage Applications", SAND98-2019.

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#### PATENTS

- "System and Management for Advanced Power Management" – US Patent 7,567,060 (Issued July 8, 2009)
- "Enhanced Distributed Energy Resource System" – US Patent 7,239,044 (Issued June 3, 2007)
- "Optimal Management of Batteries in Electric Systems" – US Patent 6,353,304 (Issued March 15, 2002)
- "Method for Power Management" – Pending

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#### LANGUAGES

- English – second language
- Dine' – native language, fluent

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#### MEMBERSHIPS

- Institute of Electrical and Electronics Engineers
- American Indian Science & Engineering Society
- International Microelectronics and Packaging Society
- Tau Beta Pi
- Eta Kappa Nu Honor Society