Juliusz Kruszelnicki

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RESEARCH INTERESTS

Modeling of low-temperature, atmospheric-pressure plasmas; plasma-chemical systems; plasma catalysis; plasma-based pollutant remediation from gases and liquids; plasma/surface interactions.

EDUCATION

2015-Present **Ph.D.** Candidate in Nuclear Engineering **University of Michigan**
GPA: 3.98/4.00
Advisor: Professor Mark J. Kushner
Focus on Plasmas and Fusion. Secondary focus on Scientifc Computing.

2010-2015 **B.Sc. cum laude** Nuclear Engineering **University of Florida**
GPA: 3.46/4.00
Honors Program, University Scholar (2014, 2015), Nuclear Engineering student of the year (2015)

RESEARCH EXPERIANCE

2015-Present **Graduate Research Assistant** **University of Michigan**
Computational Plasma Science and Engineering Group
Advisor: Professor Mark J. Kushner
Computational investigation of atmospheric pressure plasmas in packed bed reactors. Plasma/liquid interactions and chemistry. Impact of metallic catalysts on discharges.

2014-2015 **Undergraduate Research Assistant** **University of Florida**
Laboratory for Advanced Nuclear Fuels
Advisor: Professor James Tulenko
Experimental and computational work on high thermal conductivity, composite nuclear fuels. Neutronic and thermal analysis of annular pellets. Spark Plasma Sintering techniques of pellet manufacturing.

Summer 2013 **Intern Research Assistant** **Tri Alpha Energy**
Computational Physics Team
Advisor: Dr. Eric Trask
Computational investigation of Electron Bernstein Waves. Optimization of wave injection location in Field Reverse Configuration fusion reactor.

2012-2013 **Intern Research Assistant** **Oculus Research**
Medical Start-up Company
Advisor: Dr. Dan Dickrell
MATLAB and C++ routines designed for retinal vascular structure analysis, as means of early illness detection and diagnosis.

Summer 2012 **Intern Research Assistant** **Los Alamos National Laboratory**
D-5: Nuclear Engineering and Nonproliferation
Advisor: Dr. Bruce Letellier
Risk analysis of South Texas Nuclear Plant's spray/sump filtration systems. Investigation of interactions between deposits and hydraulic equipment. Plant limiting conditions.

Summer 2011 **Intern Research Assistant** **Los Alamos National Laboratory**
D-5: Nuclear Engineering and Nonproliferation
Advisor: Dr. Bruce Letellier
Kinematic characterization of explosives-propelled shrapnel. Simulations of radiography and analysis of experimental X-Ray imaging. 3D object idensitification from 2D images.

PUBLICATIONS

2017 **Juliusz Kruszelnicki**, Kenneth Engeling, John Foster, Zhongmin Xiong, Mark J. Kushner, J. 'Propagation of negative electrical discharges through 2-dimensional packed bed reactors', *J. Phys. D: Appl. Phys.* **50** 025203 (2017) (14pp). doi:10.1088/1361-6463/50/2/025203

ABSTRACTS

Podium Presentations

2017 Mark J. Kushner, **Juliusz Kruszelnicki**, Amanda M. Lietz. 'Interaction Between Atmospheric Pressure Plasmas and Liquid Micro-Droplets', *2017 International Conference on Plasmas with Liquids*, Prague, Czech Republic.

2016 **Juliusz Kruszelnicki**, Kenneth W. Engeling, John E. Foster, Mark J. Kushner. 'Properties Influencing Plasma Discharges in Packed Bed Reactors', *2016 APS Gaseous Electronics Conference*, Bochum, Germany.

2016 Kenneth W. Engeling, **Juliusz Kruszelnicki**, John E. Foster, Mark J. Kushner. 'Investigation of the Time Evolution of Micro-discharges in a 2-Dimensional Packed Bed Reactor', *2016 Hakone XV*, Brno, Czech Republic.

2016	Mark J. Kushner, Amanda M. Lietz, **Juliusz Kruszelnicki**. 'Confined Atmospheric Plasma Sources for Activating Gases, Liquids and Tissue', *2016 Hakone XV*, Brno, Czech Republic.
2015	**Juliusz Kruszelnicki**, Amanda M. Lietz, Chenhui Qu, Peng Tian, Andy Xiong, Natalia Babaeva, Jerry Wang, Mark J. Kushner. 'Geometry makes plasmas complex', *2016 Quo Vadis: Complex Plasmas*, Hamburg, Germany.
2014	**Juliusz Kruszelnicki**, Kenneth W. Engeling, John E. Foster, Mark J. Kushner. 'Properties of Atmospheric Pressure Plasmas in Packed Bed Reactors', *2016 International Conference On Plasma Science*, Banff, Canada.
2014	**Juliusz Kruszelnicki**, Jhonathan Rosales, Patrick Moo, Ghatu Subhash, James Tulenko. 'Property Analysis and Advanced Manufacturing Technique Development for Light Water Reactor Annular Composite Fuel', *2015 American Nuclear Society Student Conference*, College Station, TX, USA.
2014	**Juliusz Kruszelnicki**, James Baciak, Joseph Mack, Hank Monkhorst. 'Inertial Electrostatic/Magnetic Confinement Hybrid Fusion Device', *2014 World Association of Science Engineering and Technology Conference*, Stockholm, Sweden.

Posters

2016	**Juliusz Kruszelnicki**, Kenneth W. Engeling, John E. Foster, Mark J. Kushner. 'Effects of pulse-to-pulse Residual Species on Discharges in Repetitively Pulsed Discharges Through Packed Bed Reactors', *2016 APS Gaseous Electronics Conference*, Bochum, Germany.
2016	**Juliusz Kruszelnicki**, Kenneth W. Engeling, John E. Foster, Mark J. Kushner. 'Effects of pulse-to-pulse Residual Species on Discharges in Repetitively Pulsed Discharges Through Packed Bed Reactors', *2016 APS Gaseous Electronics Conference*, Bochum, Germany.
2014	**Juliusz Kruszelnicki**, James Baciak, Joseph Mack, Hank Monkhorst. 'Effects of pulse-to-pulse Residual Species on Discharges in Repetitively Pulsed Discharges Through Packed Bed Reactors', *2014 American Nuclear Society Conference*, Anaheim, CA, USA.
2014	**Juliusz Kruszelnicki**, James Baciak, Joseph Mack, Hank Monkhorst. 'Effects of pulse-to-pulse Residual Species on Discharges in Repetitively Pulsed Discharges Through Packed Bed Reactors', *2014 American Nuclear Society Conference*, Anaheim, CA, USA.

2013	Eric Trask, **Juliusz Kruszelnicki**. 'Ray Tracing of Electron Bernstein Waves in 2D for C-2 Equilibrium', *2013 American Physics Society Conference*, Denver, CO, USA.
2011	**Juliusz Kruszelnicki**, Bruce Letelier. 'Kinematic Characterization of High-Velocity, Explosives-Propelled Objects via X-Ray Image Analysis', *2011 Los Alamos National Laboratory Student Symposium*, Los Alamos, NM, USA.

PROFESSIONAL ACTIVITIES AND ORGANIZATIONS

2015	**Treasurer** IEEE Southeastern Michigan Nuclear Plasma Physics Section
2015	**Session Chair** University of Michigan Engineering Research Symposium
2012-2015	**University Scholar** University of Florida University Scholar Program
2011-2015	**President and Founder** Motorcycle Association of Students and Staff

AWARDS

2016	University of Michigan Graduate Symposium Best in Nuclear Sciences
	American Physical Society GEC highlight Presentation
	Fellowship, Michigan Institute of Plasma Science and Engineering
	ANS Landis Scholarship
2015	ANS Student Conference: Best Undergraduate Paper Award
	University of Florida Nuclear Engineering Student of the Year
	National Science Foundation Graduate Fellowship Honorable Mention
	University of Florida Honors Program Graduate
	University of Florida: Pagano Scholarship
	University of Florida: Jacobs Scholarship
2014	University of Florida: University Scholar Award
	ANS Landis Scholarship

	University of Florida: Pagano Scholarship
	World Association of Science Engineering and Technology Conference: Best Student Presentation
	ANS Fusion Energy Division: Outstanding Student Paper Award
2013	University of Florida: University Scholar Award
	University of Florida: Pagano Scholarship
2011	Los Alamos National Laboratory Student Symposium Best in Engineering Presentation Award

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