

# 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 Scientific 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 EXPERIENCE

- 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	<b>Intern Research Assistant</b> Medical Start-up Company <b>Advisor:</b> Dr. Dan Dickrell <i>MATLAB and C++ routines designed for retinal vascular structure analysis, as means of early illness detection and diagnosis.</i>	<b>Oculus Research</b>
Summer 2012	<b>Intern Research Assistant</b> D-5: Nuclear Engineering and Nonproliferation <b>Advisor:</b> Dr. Bruce Letellier <i>Risk analysis of South Texas Nuclear Plant's spray/sump filtration systems. Investigation of interactions between deposits and hydraulic equipment. Plant limiting conditions.</i>	<b>Los Alamos National Laboratory</b>
Summer 2011	<b>Intern Research Assistant</b> D-5: Nuclear Engineering and Nonproliferation <b>Advisor:</b> Dr. Bruce Letellier <i>Kinematic characterization of explosives-propelled shrapnel. Simulations of radiography and analysis of experimental X-Ray imaging. 3D object identification from 2D images.</i>	<b>Los Alamos National Laboratory</b>

## PUBLICATIONS

2018	<i>(In Preparation)</i> <b>Juliusz Kruszelnicki</b> , Amanda M. Lietz, Mark J. Kushner, J. 'Atmospheric Pressure Plasma Activation of Water Droplets', <i>TBD</i>  <i>(Accepted)</i> Kenneth Engeling, <b>Juliusz Kruszelnicki</b> , John Foster, Mark J. Kushner, J. 'Time-Resolved Evolution of Micro-Discharges, Surface Ionization Waves and Plasma Propagation in a 2-Dimensional Packed Bed Reactor', <i>Plasma Sources Sci. Technol.</i>
2017	<b>Juliusz Kruszelnicki</b> , Kenneth Engeling, John Foster, Zhongmin Xiong, Mark J. Kushner, J. 'Propagation of negative electrical discharges through 2-dimensional packed bed reactors', <i>J. Phys. D: Appl. Phys.</i> <b>50</b> 025203 (2017) (14pp). <a href="https://doi.org/10.1088/1361-6463/50/2/025203">doi:10.1088/1361-6463/50/2/025203</a>

## ABSTRACTS

1	Invited oral seminar
10	Contributed oral presentations
16	Contributed poster presentations
1	Fully refereed conference proceeding presentation

*Highlight Presentations*

2018	(Invited) <b>Juliusz Kruszelnicki</b> . ‘Controlling Plasma Reactivity Transfer to Gases, Solids and Liquids’, <i>University of York Exterior Seminar Series</i> , York, UK.
2017	Mark J. Kushner, <b>Juliusz Kruszelnicki</b> , Amanda M. Lietz. ‘Interaction Between Atmospheric Pressure Plasmas and Liquid Micro-Droplets’, <i>2017 International Conference on Plasmas with Liquids</i> , Prague, Czech Republic.
2017	<b>Juliusz Kruszelnicki</b> , Kenneth W. Engeling, John E. Foster, Mark J. Kushner. ‘Plasma-Surface Interactions in Packed Bed Reactors Having Metal-Catalyst Impregnated Dielectric Beads’, <i>2017 International Symposium on Plasma Chemistry</i> , Montreal, Canada.
2016	<b>Juliusz Kruszelnicki</b> , Kenneth W. Engeling, John E. Foster, Mark J. Kushner. ‘Properties Influencing Plasma Discharges in Packed Bed Reactors’, <i>2016 APS Gaseous Electronics Conference</i> , Bochum, Germany.
2015	<b>Juliusz Kruszelnicki</b> , Kenneth W. Engeling, John E. Foster, Mark J. Kushner. ‘Properties of Atmospheric Pressure Plasmas in Packed Bed Reactors’, <i>2016 International Conference On Plasma Science</i> , Banff, Canada.
2014	<b>Juliusz Kruszelnicki</b> , Jhonathan Rosales, Patrick Moo, Ghatu Subhash, James Tulenko. ‘Property Analysis and Advanced Manufacturing Technique Development for Light Water Reactor Annular Composite Fuel’, <i>2015 American Nuclear Society Student Conference</i> , College Station, TX, USA.

## PROFESSIONAL ACTIVITIES AND ORGANIZATIONS

Current	<b>Peer Reviewer</b> Journal of Physics D: Applied Physics; Chemical Engineering Journal;
2015- Current	<b>Treasurer</b> IEEE Southeastern Michigan Nuclear Plasma Physics Section
2015	<b>Session Chair</b> University of Michigan Engineering Research Symposium
2012- 2015	<b>University Scholar</b> University of Florida University Scholar Program
2011- 2015	<b>President and Founder</b> Motorcycle Association of Students and Staff

## AWARDS

2017	MIPSE Graduate Symposium Best Presentation
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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