Abdalla Nassar

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Education

The Pennsylvania State University — University Park, PA
Ph.D. in Engineering Science (GPA: 3.90) — December 2012
Post-Baccalaureate Certificate in Laser-Materials Processing
Dissertation: *Investigation of laser-sustained plasma and the role of plasma in carbon dioxide laser nitriding of titanium*
Advisor: Judith A Todd—P. B. Breneman Department Head

The Pennsylvania State University — University Park, PA
Schreyers Honors College — May 2008
B.S. in Engineering Science (GPA: 3.96)
Honors Thesis: *Characterization of Laser Induced Plasma Plumes*
Advisor: Albert E Segall—Professor of Engineering Science and Mechanics

Professional Experience

Graduate Researcher — June 2012 - Present
The Applied Research Laboratory at Penn State University — University Park, PA
Supervisors: Stephen M Copley and Edward W Reutzel

Conducted research related to laser hardening of titanium and cyber-enabled additive manufacturing. Prepared and delivered regular presentations to contract monitors and research teams.

National Science Foundation Graduate Research Fellow — June 2009 - May 2012
The Pennsylvania State University — University Park, PA
Supervisors: Judith A Todd

Investigated the role of plasma in laser nitriding of titanium, developed a computational fluid dynamics model of a laser-sustained plasma and performed a spectroscopic investigation of plasma to further understanding of critical parameters and validate the model. Conducted independent research, published articles in peer-reviewed journals and presented work at numerous technical and industry meetings. Mentored and supervised the research of several undergraduate honors students.

Teaching Intern — August 2007 - May 2008
The Pennsylvania State University — University Park, PA
Supervisors: Christine Masters

Assisted in preparation of teaching materials for EMCH 213, Strength of Materials. Developed lab-based student project assignments and tutored individual students.

Activities, Honors and Awards

- Second place oral presentation at ESM Today 2011
- Outreach direction of Engineering Science Graduate Student Council, 2010-2011
- First place poster presentation at ESM Today 2010

- President of Engineering Science Graduate Student Council, 2009-2010
- National Science Foundation Graduate Research Fellowship, Awarded 2009
- Engineering Science Student Marshal for spring 2008 commencement
- President of Engineering Science Undergraduate Student Council, 2007 - 2008
- Schreyer Honors College Summer 2007 Research Grant
- The Evan Pugh Scholar Award - Top 0.5 percent of Junior Class
- President Sparks Award
- The President's Freshman Award
- Affiliated with Schreyer Honors Collage, Tau Beta Pi, American Institute of Physics and IEEE

Journal Publications

- Francis A, Nassar A R and Mehta K *Are we formal yet? The evolving role of informal lending mechanisms to support entrepreneurship and poverty alleviation in central Kenya* International Journal of Social Entrepreneurship and Innovation (Accepted for publication)
- Nassar A R, Akarapu R, Copley S M, and Todd J A 2012 *Investigations of laser-sustained plasma and its role in laser nitriding of titanium* Journal of Physics D, Applied Physics **45** 185401
- Akarapu R, Nassar A R, Copley S M, and Todd J A 2009 *Numerical model of a laser-sustained argon plasma* Journal of Laser Applications **21** 169-75
- Akarapu, R K, Dua, P, Campbell, A, Scott, D, Nassar, A, Todd, J A and Copley, S M (2007). Characterization of Spectral Emissions from Laser Irradiated Titanium. Materials Research Society Proceedings. 1040-Q08-02.

Recent Conference Presentations

- Nassar A R, Copley S M, Todd J A (2012) *Single-Trail and Multi-Trail Laser-Sustained Plasma Nitriding of Titanium* Materials Science & Technology 2012 Conference & Exhibition, Pittsburgh, PA.
- Nassar A R, Akarapu R, Copley S M, Todd J A (2011) *On CO_2 Laser Nitriding of Titanium* Materials Science & Technology 2011 Conference & Exhibition, Columbus, OH.
- Nassar A R, Akarapu R, Copley S M, Todd J A (2011) *On The Role Of Plasma In Carbon-dioxide-laser Nitriding Of Titanium* 48th Annual Technical Conference of Society of Engineering Sciences. Evanston, IL.
- Nassar A R, Akarapu R, Todd J A, Copley S M (2011) *Laser-Sustained Plasma Deposition of Titanium Nitride Nanopowder* 2011 CISP Industry Members Meeting, University Park, PA.
- Nassar A R, Akarapu R, Todd J A, Copley S M (2010) *Coating Deposition via Insertion of Metallic Rods into a Laser-Sustained Plasma* 47th Annual Technical Meeting of Society of Engineering Science, Iowa State University, Ames, IA.
- Nassar A R, Akarapu R, Todd J A, Copley S M (2009) *A Local Thermodynamic Equilibrium Model of a Laser-Sustained Plasma in a Forced Argon Flow* 2009 Joint ASCE-ASME-SES Conference on Mechanics and Materials, Blacksburg, VA.

Technical Expertise: Laser-integrated manufacturing, laser nitriding, additive manufacturing, plasma diagnostics, materials characterization methods, computational fluid dynamics modeling, engineering electromagnetics, finite volume methods and computational methods.

Proficient in: MATLAB, Mathematica, ANSYS Fluent, COMSOL, SolidWorks, AutoCAD, Java, C++ and LaTeX