W. Ethan Eagle

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Highlights

• Expert in developing the culture and mindset of innovation • author, speaker, and promoter of 'Big Ideas'
• Passionate ally who believes excellence demands diversity of ideas, knowledge, and expertise.
• 9 published and/or accepted journal articles, 3 as first author, Featured in Op-Ed, podcasts, and blogs on science and engineering. • Award winning laboratory instructor and coach.

INNOVATION / ENTREPRENEURIAL EXPERIENCE

INNOVATRIUM Innovation Professor of Practice | Nov 2012 - current

Teacher Eval. 4.2 /5 | Reference: ✉Dr. Jeff DeGraff www.innovatrium.org, www.cpinnovator.com

In this program I was hired to help coach and develop innovation leaders through the Innovatrium Institute for Innovation. Using my coaching experiences, I co-developed a curriculum with Dr. Jeff DeGraff in 2014 and currently teach an online course each fall for the University of Michigan - a 90 day innovation training certificate, the "Certified Professional Innovator." Leading Innovation - Online

- Provided coaching in the necessary tools and techniques to stimulate and manage innovation.
- Lead executives through frameworks and methods for strategizing, developing, and implementing innovative solutions.
- Gave leaders concrete examples of innovations to demonstrate the skill base necessary to manage breakthrough innovation-focused projects, people, and ventures.
- Emphasized how innovation tools and methods can be successfully employed in real work environments
- Used a tool from the Competing Values frame work created by Jeff DeGraff called the Innovation Leadership Assessment to determine each executive's 'innovation genome'
- Led bi-weekly group coaching and teleconferences after the boot camp to build on momentum, keep participants focused and projects moving along, and help participants develop a proof of concept/prototype
- Worked with a team of reviewers at the completion of the project to evaluate the success metrics participants had developed, give them feedback on the summaries of their innovation project, its progress, key insights, and future plans
- Innovation implementation led to successful launch of new product segments ($50M growth), and doubling of enrollments.

CURRICULUM DEVELOPER Engineering for Us All | Oct 2018 - Current

College Park, MD | Reference: ✉Dr. Darryll Pines

I was recruited to a dynamic team led by Dean Darryl Pines to help create, recruit, and train teachers to lead innovative project-based learning at the high school level (An AP Engineering Curriculum.)

- Planned, organized, and facilitated 120+ engineering professors, industry and high school teaching constituents from around the US to gather facts and align curriculum outcomes December 2018.
- I lead a curriculum team of 7 people to transform these learning outcomes into unit guides and implementable, scalable lesson plans and we continue to develop this novel, student-centered, responsive teaching curriculum in engineering. Feburary - Current
- I have been the teacher point of contact for communication and recruitment plan for the 10 high-schools participating in the pilot year for this program - all built from next to nothing in less than three months.

GLOBAL ENGINEERING PROGRAM Global Engineering Professor | Summer 2018 and 2019

Teacher Eval. 4.5 /5 | Reference: ✉Dr. Chin-An Tan

This unique program paired engineering students from the US along side Chinese students to scope and solve a problem related to transportation, energy, and environmental sustainability. Students spent 8 weeks learning online, and 5 weeks together in China. They focused on global solutions that could have a real market impact - studying trends in customer behavior and technology development. Teams learned essential steps to innovation following the Innovation Genome framework. Student performance on their final presentations was judged by an external panel of industry experts. Students report that the global

engineering experience, travel and contact with international students and the learning about global engineering innovation was a transformative experience and the best class they have ever taken. Program

LEAR OPEN INNOVATION COMPETITION Instructor and Coach | Spring 2017 and 2018
Detroit, MI | Reference: ✉Staney DeGraff, CEO Innovatrium | Lear Open Innovation Website.

Working on a small team from the Innovatrium, I helped us to win a contract from Lear to run this competition for them. I recruited faculty and students from 6 universities to attend a two week 'alternative spring break' innovation competition. A two-day intensive innovation training and problem identification session was followed by two weeks of innovation coaching and a final day of competitive design judging and idea pitching. The teams were purposefully multi-disciplinary and multi-university, and the top teams were awarded internship offers to build out their prototypes. Link to press, click here.

DOE LAB-CORPS Innovation Participant | March 2015 - May 2015
Sandia National Labs, Livermore, CA

I received executive coaching and 40 hours of training regarding business modeling and competed in technology 'pitch' competition for kHz laserless particle tracking system based on my PhD and post-doctoral work.

EDUCATION

UNIVERSITY OF MICHIGAN PhD Aerospace Engineering 2012
Thesis: An experimental study of three-dimensional inlet shock-wave boundary layer interactions.

UNIVERSITY OF MARYLAND MS Aerospace Engineering 2007
Thesis: Modeling of a high energy density $Al - H_2O$ underwater vehicle propulsion system

UNIVERSITY OF MARYLAND BS Aerospace Engineering, BS Mathematics 2006

PROFESSIONAL EXPERIENCE

UNIVERSITY OF MARYLAND, KEYSTONE PROGRAM Lecturer | Aug 2018 - Current
Reference: ✉Dr. Ethan Eagle, University of Maryland

I am a full-time instructor for the Keystone program, the University of Maryland's freshman and sophomore success center. I taught introduction to engineering design, ENES100 to two sections of 40 students. The teaching team each semester is between 8 and 10 faculty members. I have redeveloped rubric and instructional materials to enhance the responsive teaching practices of the instructional faculty and brought teamwork principles from my innovation practice to the classroom.

WAYNE STATE UNIVERSITY, PROMETHEUS LABS Assistant Professor | Jan 2017 - June 2018
Reference: ✉Dr. Ethan Eagle, Wayne State University

My labs focused on combustion-system innovations for meeting pollutant emissions standards and improving fuel efficiency, with an emphasis on personal mobility and urban transportation infrastructures and their impact on human and environmental health. The goal was to design engines that clean the air while they drive (or fly). I committed to increasing student achievement at Wayne State through exemplary teaching and mentoring and by generating and distributing free educational resources for student success.

COMBUSTION RESEARCH FACILITY, CRF Post-Doctoral Fellow | Oct 2013 - Nov 2016
Reference: ✉Dr. Mark Musculus, Sandia National Laboratories

I managed multiple research focuses, delivering research results on seven research topics and publishing on three, while also making time to engage with opportunities for post-doctoral development and entrepreneurship training.

COMBUSTION LABORATORY, ORC Post-Doctoral Researcher | April 2012 - Oct 2013
Ref: ✉Dr. Margaret Wooldridge, University of Michigan Mechanical Engineering

In my first post-doc, I collaborated with diverse groups including a large research team (20+) to deliver research on battery degradation, as well as a smaller research team (7) working to understand fuel effects in injection systems. I also provided regular mentoring to our 4 graduate and 2 undergraduate students and led research group meetings.

JOURNAL PUBLICATIONS

Total Citations, Google Scholar: 116

W. Ethan Eagle, Louis-Marie Malbec and Mark P.B. Musculus *Measurements of Liquid Length, Vapor Penetration, and Flame lift-off length for the Engine Combustion Network 'Spray B' in a 2.34L Optical Heavy Duty Engine* SAE Int. J. Engines 2016

Louis-Marie Malbec, **W. Ethan Eagle**, Mark P. B. Musculus and Peter Schihl *Influence of Injection Duration and Ambient Temperature on the Ignition Delay in a 2.34L Optical Diesel Engine* SAE Int. J. Fuels and Lubricants 2016:9(1). doi:10.4271/2015-01-1830

Mohammad Fatouraie, **W. Ethan Eagle**, Dingsheng Li, Masako Morishita, James Barres, Margaret S. Wooldridge, James G. Wagner, Olivier Jolliet "Combustion-generated particle synthesis and delivery system for inhalation exposure studies: case study for ceria nanoparticles" Aerosol Science and Technology 2016

W. Ethan Eagle and Mark P.B. Musculus *An Improved Entrainment Rate Measurement Method for Transient Jets from 10kHz Particle Image Velocimetry* accepted Atomization and Sprays December 2015

W. Ethan Eagle and James F. Driscoll *Shock Wave-Boundary Layer Interactions in Rectangular Inlets: 3-D Separation Topology and Critical Points* Journal of Fluid Mechanics. Oct. 2014; 756:328-353. 10.1017/jfm.2014.382

Rohan R. Morajkar, Robin L. Klomparens, **W. Ethan Eagle**, James F. Driscol, Mirko Gamba, and John A Benek *Relationship Between Intermittent Separation and Vortex Structure in a Low-Aspect-Ratio 3D Shockwave Boundary-Layer Interaction* Accepted to AIAA Journal Aug. 2014

W. Ethan Eagle, Steven Morris, and Margaret Wooldridge *High-speed Imaging of Transient Diesel Spray Behavior During High Pressure Injection of a Multi-hole Fuel Injector* Fuel. Feb. 2014; 116:299-309. doi:10.1016/j.fuel.2013.07.120

Darshan Karwat, **W. Ethan Eagle**, and Margaret Wooldridge, Thomas Princen *Are there ecological problems that technology cannot solve? Water scarcity and dams, climate change and biofuels* International Journal of Engineering, Social Justice, and Peace. 3:1 7-25.

Darshan Karwat, **W. Ethan Eagle**, Margaret Wooldridge, and Thomas Princen *Activist Engineering: Changing Engineering Practice By Deploying Praxis* Science and Engineering Ethics. Feb. 2014; doi:10.1007/s11948-014-9525-0

Daniel F. Waters, Christopher P. Cadou, and **W. Ethan Eagle** *Quantifying Unmanned Undersea Vehicle Range Improvement by Aluminum-Water Power System* AIAA Journal of Propulsion and Power. Oct. 2013; 29:3 675-685. doi: 10.2514/1.B34701

CRLT:ENGINEERING Engineering Teaching Consultant | Aug 2010 - May 2011
Reference: ✉Dr. Tershia Pinder-Grover
I was a peer mentor responsible for 50+ graduate instructors. I provided consultations on public speaking, conflicts, and time management.

- Recognized as outstanding graduate instructor of the year at both college and university level.
- Provided detailed coaching on instructional techniques and facilitated 2 workshops, one to improve classroom engagement and a second on advisor/advisee conflict management.

AWARDS

I believe recognition is a welcome chance to reflect on the role that others have played to enable my success.
2014 Sandia Outstanding Post-Doc Poster Winner • 2012 Michigan Distinguished Leadership Award • 2011 Boeing Fellowship • 2011 Rackham Outstanding Graduate Instructor • 2011 Graduate Teaching Certificate • 2011 College of Engineering Outstanding Instructor • 2007 Minta Martin Fellowship • 2006 Swales Aerospace Award • 2002 Glenn L. Martin Award

SKILLS

I constantly work to expand and improve my skills to suit my current and future organizational roles.

Organization and Project Management

Innovation Strategy • Business Development and Tech Transfer • SBIR Proposal Writing • Experiment Planning • Getting Things Done (GTD) • Proficient with Word/Execl/PPT • LaTeX • Collaboration tools, e.g. #slack, Google Drive, Mendeley, Doodle, SignUpGenius, Overleaf, Google Hangouts, WebEx, GotoMeeting, Dropbox, Box

Professional Development

Strength Weakness Opportunity and Threat (SWOT) Assessment • Diversity and Inclusion Coaching • Peer Mentoring • Network Development • Alumni Outreach

Experimental and Theoretical Methods

Data Processing and Analytics • CFD Validation and Verification • Compressible, Viscous, Turbulent Fluid Dynamics • Particle Image Velocimetry • Laser Induced Fluorescence and Incadescence 1064, 532 and 266nm • Schlieren Diagnostics • kHz Imaging and Image Processing • Uncertainty Quantification • Design of Experiments • Infrared Imaging

Experimental Setups

Optical Engines • High-Pressure (1000+ bar) fuel pressure systems • Constant Volume Combustion Chambers • Atmospheric Hencken Burner • Solid Pre-cursor Doped Nano-particle Generation • Supersonic Wind-tunnels • X-ray Diffraction • Transmission Electron Microscopy

REFERENCES

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