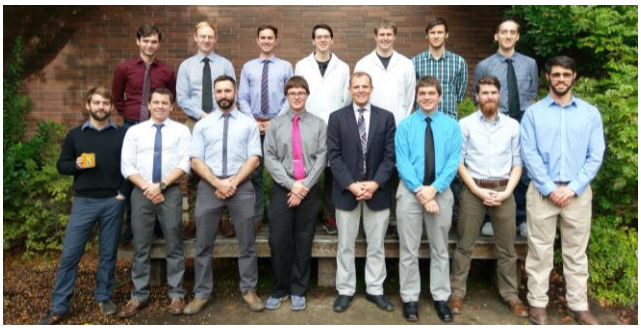
2017 Year in Review for the Blunck Research Group

Dear Colleagues and Friends,

This is the third annual newsletter reviewing the past year for the Blunck research group at Oregon State University. This year was full of great accomplishments by the students and many advances in our research. We are grateful to our many collaborators, funding agencies, and colleagues who make our progress possible. I hope that you will find the newsletter enjoyable and informative.

Overview

The research group has 10 graduate students (advised and co-advised) and multiple undergraduate students (see picture). We continue to perform research related to detonations, forest fires, turbulent and MILD combustion, infrared thermography, and ignition. These areas align with our key competencies in the fields of combustion, ignition, radiation, and energy.



Members of research group in fall of 2017.

Our culture of integrity, diligence, and excellence continues to develop within the group. It is quite rewarding to see the students encourage, support, and push each other. It is not uncommon for them to arrange group activities outside of the laboratory where they have professional development (e.g., touring a production facility), participating in intermural sports (they have sought to recruit me to no avail), or enjoying recreational activities outside of the school.

Successes of Students and the Group:

- Three students had internships at Air Force Research Laboratory during the summer. It was an excellent opportunity for them and they were able to make great contributions. One supervisor said "having [] here has been great. He appears to be careful, calculated, diligent, and independent...all of the things that I think will make him a great researcher." Another researcher said, "Student [] has been great this summer. He's motivated and eager to work on everything. That's the best thing you can ask for from a summer intern."
- Aaron Filo's MS thesis received the 2017 OSU Distinguished Master's Thesis Award. His thesis focused on measuring the turbulent flame speed of jet fuels. He is now working with Dr. Kyle Niemeyer performing DNS of turbulent combustion.
- Tyler Hudson received an Outstanding Graduate Research Assistant Award from the School for his excellent progress in research while serving as a teaching assistant.
- Our research into the physics controlling the formation of embers during wildland fires received media attention. More information is available on our Facebook page.
- We were able to participate in several field studies for our forest fires research. A picture

Former and current students at Air Force Research Laboratory this summer.

from one of the campaigns in shown on page 2. We were excited to collect data until the fire was aborted because trees started torching.

Student watching trees torch during field study sponsored by The Nature Conservancy of Oregon.

- Six group, current and former, members were able to present papers at the U.S. National Combustion Meeting at the University of Maryland in April.
- Manufacturing and installation was commenced for a 20 ft. detonation tube with optical access (picture shown below).
- A third laboratory (of sorts) was set up at my property. We call it the B-lab (Burn/Blunck Lab). Here we burn medium scale trees (~10 ft.) to study ember production.
- We had several peer-reviewed publications this past year, an invited article accepted for the Encyclopedia of Wildfires and Wildland-Urban Interface, and were able to submit several papers for the upcoming Combustion Symposium.

Other Accomplishments:

Detonation tube with optical access.

- I was nominated from the School for the Engelbrecht Young Faculty Award for the College of Engineering.
- My family moved to a home with several acres of land in January. We are grateful for the opportunity for our family. It was been a great adventure.
- My colleague (Dr. Nancy Squires) and I are working to form an Aeronautical and Astronautically Consortium on campus. A goal of this effort is to strengthen our relationships with industry and provide more opportunities for student involvement.

Looking Forward:

In this coming year there will be several students who graduate and find employment. I look forward to their continued success and to their research being polished, published and presented. Our detonation tube with optical access will become functional this year. We anticipate on-going field studies as part of our forest fire research. In summary, we are looking forward to a very productive and diverse year.

Concluding Remarks:

I hope that each of you are doing well professionally and personally. Please be sure to stop and visit the group when you are in the Pacific Northwest.

Best Wishes,

David

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