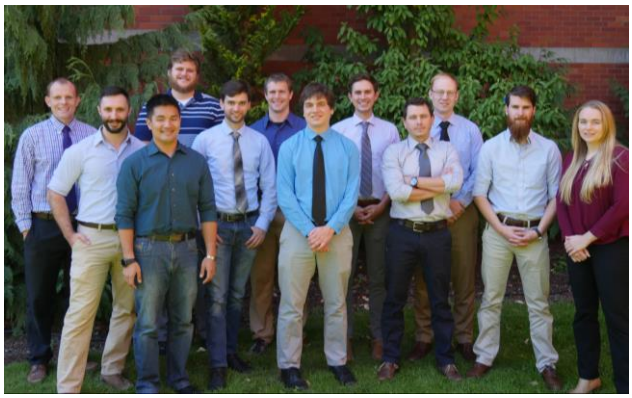
2018 Year in Review for the Blunck Research Group

Dear Colleagues and Friends,

This is the fourth annual newsletter reviewing the past year for the Blunck research group at Oregon State University. This year was another year full of great accomplishments by the students of the group. We are very grateful to our many collaborators, funding agencies, and colleagues who make our progress possible.

Overview

The research group in 2018 had 10 graduate students and multiple undergraduate students. We continue to perform research related to detonations, wildfires, 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 2018.

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 organize professional development sessions (e.g., touring a production facility), participate in intermural sports (they have sought to recruit me to no avail), or enjoying recreational activities outside of school (hiking the second highest mountain in Oregon).

Successes of Students and the Group:

- Two new PhD students joined the research group. Kaz Teope is a Major in the United States Air Force and is on leave from the Air Force for 3 years to earn a PhD. Previously he was an instructor at the United State Air Force Academy. Harley Glad joined the group after graduating from Southern Utah University (SUU). She is a former assistant basketball coach at SUU and was recognized as one of the top female engineering students.
- Parker Weide defended his M.S. thesis focused on MILD combustion of large hydrocarbon fuels, and has subsequently started working at NASA Marshall Flight Center.
- Tyler Hudson defended his thesis identifying processes that control the generation of embers. He is now teaching part at OSU-Cascades and working part time with the group as a research associate.
- We burned over 100 large (i.e., 3-5 m) trees. We know of no other study that burned more than 2 large trees at one time, aside from prescribed burns. This effort was part of our research to identify the processes that control how embers are formed.

Western juniper tree burning as part of an effort to identify properties that control ember generation.

- Our group was selected to lead a $2M effort funded by SERDP studying burning of live fuels. We will collaborate with colleagues from OSU and from the U.S. Forest Service.
- We received significant media coverage for our wildfire and ignition research. Our research was mentioned in the New York Times, U.S.A Today, and Statesman Journal. Some of our infrared video of ember generation was included in a news story by the Discovery Channel.
- Mick was able to successfully commission the operation of our detonation tube with optical access. It will be used to identify the influence of combustion products on detonations.
- Jonathan Bonebrake and Benjamin Smucker were able to present at the International Combustion Symposium in Dublin, Ireland.
- We presented the findings from our research with engineers from multiple national laboratories (AFRL, NRL, Forest Service) and gas turbine engine companies (GE, Pratt and Whitney, Williams International). We are very grateful for our interactions.

Detonation tube with optical access.

Other Accomplishments:

- I was nominated from the School for the Engelbrecht Young Faculty Award from the College of Engineering.
- My tenure and promotion packet was submitted and is currently under review at the University level.
- I was able to serve on a multi-state panel focused on providing technical guidance to policy makers regarding avoiding major wildfires.
- Sheri and I started a hobby farm where our sons raise and sell produce and pumpkins to our neighbors. Feel free to contact the Blunck boys if anyone needs a loan – the first year went very well.

Looking Forward:

In this coming year there will be several students who graduate, and we will have three students join the research group. We will begin collecting data of interest from our detonation tube and expect to complete much of our ignition and smoldering combustion research. We will also begin applying laser diagnostics to study burning and ignition above live fuels. 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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