Welcome
The 1st International Workshop on Near Limit Flames will be held on July 29-30, 2017 at Boston University Photonic Center in Boston, Massachusetts, USA, before the 26th International Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS 2017).

Scope and Topics
Scope: To meet the goals of the Paris Agreement, limiting global warming to 2°C above pre-industrial levels, CO₂ emissions from combustion power generation need to be reduced. Biofuels and advanced engine technologies such as supercritical combustion, low temperature combustion, oxy fuel combustion, pressure gain combustion, microscale combustion, and plasma assisted combustion have great potential to improve combustion efficiency and reduction emissions. The drastic changes in fuels and the extreme engine operation conditions will significantly change the flame regimes and dynamics at near limit conditions. As such, it is necessary to advance fundamental understanding of near limit flame dynamics at extreme conditions for co-optimization of engine and fuel design.

The workshop aims to discuss the recent progress and challenges and to formulating future collaborations in theoretical, computational, and experimental studies of near limit flame dynamics in the following topic areas.

Topics and Sessions
- Topic 1. Cool flames
  (Coordinators, Nabiha Chaumeix and Yiguang Ju)
- Topic 2. High pressure flames and diagnostics at engine conditions
  (Coordinators, Isaac Boxx and William L. Roberts)
- Topic 3 Combustion Instability and hydrodynamic Stability of Reacting Flows
  (Coordinators, Tim Lieuwen and Jacqueline H. Chen)
- Topic 4 Near-limit detonation and flame dynamics
  (Coordinator, Antonio L. Sanchez and Hoi Dick Ng)
**Scientific Committee**

- Joachim Beeckmann, Aachen University (Germany)
- Isaac Boxx, German Aerospace Center-DLR (Germany)
- Jackie Chen, Sandia National Laboratory (USA)
- Zheng Chen, Peking University (China)
- James Driscoll, University of Michigan (USA)
- Nabiha Chaumeix, CNRS-ICARE (France)
- Yiguang Ju, Princeton University (USA)
- Timothy C Lieuwen, Georgia Institute of Technology (USA)
- Kaoru Maruta, Tohoku University (Japan)
- Sergey Minaev, Far Eastern Federal University (Russia)
- Hoi Dick Ng, Concordia University (Canada)
- William L. Roberts, King Abdullah University of Science and Technology (Saudi Arabia)
- Antonio L. Sanchez, University of California San Diego (USA)
- Steven Shy, National Central University (Taiwan)
- Arnaud C. Trouve, University of Maryland (USA)

**Local Organizers**

- Prof. Yiguang Ju, Princeton University (USA)
  Department of Mechanical and Aerospace Engineering
  Princeton University, Princeton, NJ 08544
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- Dr. Isaac Boxx, German Aerospace Center (DLR) (Germany)
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- Prof. Jillian Goldfarb, Boston University
  Department of Mechanical Engineering,
  Division of Materials Science & Engineering
  Boston University
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- Dr. Jenny Chao, FM Global Inc. Explosion Group
  jenny.chao@fmglobal.com

**Venue and hotel:** The workshop will be held at the Photonic Center of Boston University, Massachusetts, USA, one day before the 26th International Colloquium on the Dynamics of Explosions and Reactive Systems (ICDERS 2017). For hotels and travel directions, please see the official ICDERS website at [http://icders2017.com/](http://icders2017.com/)

**Deadlines:**

- April 1, 2017: Online registration start on workshop website
- May 31, 2017: Early bird registration ends
- July 15, 2017: Extended registration ends
- July 15, 2017: Highlight speaker application to conference organizers:
- July 29, 2017: Onsite registration open (cash only)
Registration: For registration, please click online registration or use the link below:
https://regonline.com/nearlimitflames

US Students and Postdocs Travel Support: The US students and young researchers will be partially supported by NSF travel grants, depending on the available funds from NSF. To apply for this travel grant, please fill the online google form by clicking Students/Postdocs Travel Support (on the workshop website) after you completed your registration. Please fill the information accurately to avoid delay of your reimbursement. Also, please keep your original receipts of hotels and transportation for reimbursement after the workshop.

Program: The workshop program will be updated timely as it is finalized on the workshop website at: http://www.princeton.edu/~yju/1st_near-limit-flames_workshop.html

Program (Draft)
The 1st International Workshop on Near Limit Flames
July 29th-30th 2017, Photonics Building, Boston University

Saturday, July 29th 2017
8:00-8:30 am Registration and Breakfast
8:30-8:35 am Welcome: Yiguang Ju

Topic 1. Cool flames
Co-Chairs: Nabiha Chaumeix and Yiguang Ju

8:35-9:15 am Invited Lecture: Cool Flames in Microgravity
Forman A. Williams (University California, San Diego, USA)

9:15-9:45 am Position Lecture: Dynamics of near limit cool flames
Yiguang Ju (Princeton University, USA)

9:45-10:15am Position Lecture: Cool flames in high pressure turbulent flow
Jacqueline H. Chen (Sandia National Lab, USA)

10:15-10:35am Coffee break

10:35-11:05am Position Lecture: Cool flames in micro channel
Kaoru Maruta (Tohoku University, Japan)

11:05-11:35am Position Lecture: Low-Temperature Combustion Chemistry in IC Engines
Mike Kweon (Army Research Laboratory, USA)

Topic 2. High pressure flames and diagnostics at engine conditions
Co-Chairs: Isaac Boxx and William L. Roberts
11:35am-12:15pm Invited Lecture: Turbulent flames at Reynolds number
James Driscoll (University of Michigan, USA)

12:15pm-12:45pm Position Lecture: Combustion at high pressure
William L. Roberts (KAUST, Saudi Arabia)

12:45-14:00 pm Lunch break

14:00-14:30pm Position Lecture: High pressure turbulent flame initiation and propagation at large Reynolds number
Steven Shy (National Central University, Taiwan)

14:30-15:00pm Position Lecture: DNS of high Karlovitz number turbulent premixed flames
Evatt Hawkes (UNSW, Australia)

15:00-15:30pm Position Lecture: DNS of High Karlovitz turbulent flames
Alexei Polunenko (Texas A&M University, USA)

15:30-16:00pm Position Lecture: Large eddy simulations of turbulent jet flames at high pressures
Hong Im (KAUST, Saudi Arabia)

16:00-16:20 pm Coffee break

16:20-16:50pm Position Lecture: TBD
Nilan Chakraborty (Newcastle University, UK)

Topic 3. Combustion instability and hydrodynamic stability of reacting flows
Co-Chairs: Timothy C Lieuwen and Jacqueline H. Chen

16:50-17:30pm Invited Lecture: Flame Dynamics, Hydrodynamics, and Acoustics
Timothy C Lieuwen (Georgia Institute of Technology, USA)

17:30-18:00pm Position Lecture: Combustion Instability Mechanisms and Suppression
Jacqueline O’Connor (Pennsylvania State University, USA)

18:00pm-20:00pm Dinner and poster session

Sunday, July 30th 2017
8:00-8:30 am Registration and Breakfast

08:30-09:00am Position Lecture: Combustion and emissions in gas turbines
Keith McManus (GE Global Research Center, USA)

9:00-9:30am Position Lecture: Sensitivity analysis of combustion instability
Matthew Juniper (University of Cambridge, UK)

9:30-10:00am Position Lecture: Engine scale stability predictions using Large Eddy Simulations
Topic 4. Near-limit detonation and flame dynamics  
*Co-Chairs: Antonio L. Sanchez and Hoi Dick Ng*

10:20-11:00am **Invited Lecture: Near-Limit-Propagation Issues in Detonation Propulsion**  
Frederick R. Schauer (AFRL, Wright-Patterson, USA)

11:00-11:30am **Position Lecture: Pressure Gain Combustion in Microchannels: Flame Acceleration and Transition to Detonation**  
Ryan Houim (University of Maryland, USA)

11:30am-12:00pm **Position Lecture: Flame acceleration and the transition to detonation in microscale tubes**  
Ming-Hsun Wu (National Cheng Kung University, Taiwan)

12:00pm-13:10pm Lunch Break

13:10-13:40 pm **Position Lecture: Dynamics of Premixed Flames in Long Narrow Channels**  
Moshe Matalon (University of Illinois at Urbana-Champaign)

13:40-14:10 pm **Position Lecture: Collective dynamics of flames in a system of regularly packed micro channels**  
Sergey Minaev (Far Eastern Federal University, Russia)

14:10-14:30 pm Coffee Break

**Session 5: Group Discussions of 4 Research Topics**  
14:30-15:00pm Group discussions (*Chaired by Topic co-chairs*)

**Session 6: Presentation of Topic Discussions and Summary**  
*Co-Chairs: Zheng Chen and Kaoru Maruta*  
15:00-15:15 pm Cool flames  
15:15-15:30 pm High pressure turbulent combustion  
15:30-15:45 pm Combustion instability  
15:45-16:00 pm Detonation and microchannel combustion

16:00pm Adjourn