The 1\textsuperscript{st} Flame Chemistry Workshop

\textbf{Background and Scope:} With increasing concerns of energy security and climate change, development of alternative fuels and advanced engine technologies using high pressure, low temperature, thermal and compositional stratified flow, homogeneous charge compression ignition, and non-equilibrium plasma discharge combustion at near flammability limit conditions provide a potential approaches to increasing energy conversion efficiency and reducing air pollutant emissions. The recent nuclear accidents in Japan further emphasize that combustion will remain as a major energy conversion methodology for even a more extended period than previously forecast. New combustion technologies at extreme conditions often lead to increased flame instability and incomplete combustion. It is of great importance to advance fundamental understanding of ignition and flame chemistry at extreme conditions to achieve accurate control of ignition timing, heat release rate, flame instability as well as emission.

\textbf{Objective:} The goal of this workshop is to assemble experts in combustion chemistry, flames, modeling, and diagnostics to identify the pathways for the development of predictive high pressure flame chemistry and collaborative research. The workshop will address the following challenges in flame chemistry,

- What are the new findings and the major knowledge gaps in understanding flame chemistry at extreme conditions?
- How to formulate theoretical and experimental strategies to narrow the knowledge gap and develop better predictive kinetic models?
- What are the major differences in chemistry between homogeneous ignition and flames?
- How does low temperature chemistry affect ignition and combustion in high pressure HCCI and gas turbine engines?
- Are the low pressure flame data and transport models sufficient to higher pressures? How can we quantify the fidelity of high pressure flame chemistry and transport data?
- How can we extract constraining information for model construction from macro measure ignition delay time, flame speeds, and extinction limits?
- What diagnostics can we apply to high pressure systems?
- Are current diffusion/reaction models viable at extreme high pressure?
- Can this workshop formulate collaborative relationships in research and education?
- Can this workshop make some focused recommendations of the grand challenge topics in flame chemistry to combustion research community?
Time: July 28-29, 2012

Place: Warsaw, Poland (34th International Symposium site)

Anticipated presentations: 8 invited talks and 40 poster presentations

Anticipated participants: 50

Proceedings Publications: The Workshop Proceedings will be made available at http://engine.princeton.edu/FC, and will include a summary of the major discussion topics, research topic recommendation, and mutually agreed directions for collaborative research.

1st Workshop Organizing Technical Committee Members and Coordinators*:

1. Zheng Chen (Peking University, China, <chenzheng@coe.pku.edu.cn>)
2. Suk Ho Chung (KAUT, Saudi, <sukho.chung@kaust.edu.sa>)
3. Henry Curran (Galway, Ireland, <henry.curran@nuigalway.ie>)
4. William H Green (MIT, USA, <whgreen@mit.edu>)
5. Nils Hansen (Sandia National laboratory, USA, <nhansen@sandia.gov>)
6. Kobayashi Hideaki (Tohoku University, Japan, <kobayashi@ifs.tohoku.ac.jp>)
7. Yiguang Ju* (Princeton University, USA, <Yju@princeton.edu>)
8. Stephen J. Klippenstein (Argonne National Lab, USA, <sjk@anl.gov>)
9. Matt Oehlschlaeger (Rensselaer Polytechnic Institute, USA, <oehlsm@rpi.edu>)
10. Heinz Pitsch (Aachen University, Germany, <h.pitsch@itv.rwth-aachen.de>)
11. Fei Qi (University of Chinese Science and Technology, China, <fqi@ustc.edu.cn>)
12. Hai Wang* (University of Southern California, USA, <haiw@usc.edu>)
13. Tamas Turanyi (Eötvös University, Budapest, Hungary, <turanyi@chem.elte.hu>)
14. Alison S Tomlin (University of Leeds, England, <fueast@leeds.ac.uk>)
15. Robert S Tranter (Argonne National Lab., USA, <tranter@anl.gov>)

Workshop Advisory Committee Members:

1. Philippe Dagaut (Orleans, France, <cnf@cnrs-orleans.fr>)
2. Frederick L. Dryer (Princeton, USA, <fldryer@Princeton.EDU>)
3. Ranold Hanson (Stanford University, USA, <rkhanson@stanford.edu>)
4. Chung K. Law (Princeton, USA, <cklaw@princeton.edu>)
5. Katharina Kohse-Hoeinghaus (Bielefeld, Germany, <kkh@uni-bielefeld.de>)
6. Charlie Westbrook (Lawrence Livermore, USA, <westbrookck@earthlink.net>)
7. Forman Williams (UC San Diego, USA, <fwilliams@eng.ucsd.edu>)

Support

Partial support for organization of this workshop will be…