

Bakhtier Farouk, Mechanical Engineering and Mechanics Department

I attended the Sixth Asia-Pacific International Symposium on the Basics and Applications of Plasma Technology (APSPT-6) held in Hsinchu, Republic of China (Taiwan) held during December 14 – 16, 2009.

(http://www.meetmax.com/upload/gec1009/Second_Announcement_APSPT6.pdf).

The conference brought together researchers from Asia-Pacific areas, North and South Americas, and East and South-east Asia to establish contact and collaboration in the research areas in the basic plasma phenomena and industrial applications.

I gave a presentation during the session "E4: Atmospheric Plasma Discharges" titled "Characterization of Atmospheric-Pressure Plasma Discharges for *High-Rate Thin Film Deposition*" co-authored with my former doctoral student T. Farouk, and my colleague A. A. Fridman.

I was the first speaker at the session, so I prepared my talk with more background material than I might otherwise have. One of the organizers (Professor Chih-An Wang) was very thankful that I did and said that my talk made for an excellent keynote talk to get things started... I was also able to present some new results that I think should help maintain my status as someone at the forefront of this area of research (and Drexel as a good place for students to come to if they want to work in the area of plasma processing).

Overall, the conference was very productive for me. I was able to run into two Korean colleagues and discussed about our simulations of atmospheric pressure microdischarges. I was able to have a number of extended lunch/dinner discussions with my other Asian/US colleague who are well recognized researchers in the field. I was also able to attend all other sessions in the meeting and found several of the papers to be of great interest to me...

My visit to Hsinchu Taiwan allowed me to touch base with another set of colleagues with whom I interact at the National Cheng Kung University, (NCKU) Tainan, Taiwan...I never visited this well-reputed university – which is an excellent place for recruiting high-quality Ph. D. students. My host Professor R-J. Yang extended me a very warm welcome to the school and arranged a seminar where I talked about my current research projects to the students and faculty of the Mechanical Engineering Department at NCKU. I also met one of my former colleagues at Drexel (Professor D-S Feng who was serving as one of the Vice-Presidents at NCKU).

Support from an ITA award was a significant factor in enabling my attendance at the APSPT-6 meeting at Hsinchu and Taiwan and my visit to NCKU at Tainan, Taiwan... At nearly \$3000 for the trip (airfare being over \$1200), my international travel budget would not have been enough without this extra bit of help.



Professor Farouk at the venue of the APSPT-8 conference, Mingshin University of Science and Technology, Hsinchu, Taiwan, December 14, 2009

專題演講

Thermally Induced and Mechanically Generated Acoustic Waves in Gases and Supercritical Fluids: Recent Advances

Speakers: Prof. Bakhtier Farouk 講座教授(美國Drexel大學 機械工程系)

Moderator: NCKU研究總中心主任 Prof. Ruey-Jen Yang

Date: Dec.16, Wed., 14:10~15:30

Place: 自強校區系統系八樓工學院會議室

ABSTRACT

The physics of the interaction of acoustic waves and the fluid medium in which they travel is a challenging problem. Pressure (acoustic) waves can be generated in a fluid either thermally or mechanically. Recent developments in the fundamental understanding of these interactions will be reviewed. Numerical investigations of the effects of thermally induced acoustic wave motion on the developing natural convection process in a compressible gas-filled square enclosure will be reviewed first. The generation and the short time behavior of thermally induced acoustic waves in an enclosure will be explored both for ideal gases and supercritical carbon dioxide. The acoustic wave induced mixing and transport in supercritical fluids are significant due to the vanishingly low thermal diffusivity of such fluids. Long time effects of these waves on the buoyancy induced flows will also be presented. The flow and heat transfer in an enclosure with a vibrating wall will be considered next. Here the acoustic field in the enclosure is explicitly computed along with the primary periodic flow field. Due to the interaction of the oscillating flow with fluid properties, steady secondary flow fields are generated in the enclosure (acoustic streaming). Both computational and experimental results will be presented which show the effects of the vibrating wall amplitude and frequency on the formation of this second order flow.

主辦單位:研究總中心



歡迎老師及學生踴躍參加!

Professor Farouk's seminar flyer, National Cheng Kung University, Tainan, Taiwan, December 16, 2009



Professor Farouk with his host Professor R-J. Yang and his graduate students, Department of Mechanical Engineering, National Cheng Kung University, Tainan, Taiwan, December 16, 2009