

# *The 6th JUACEP Seminar*

第6回 名古屋大学日米協働教育プログラムセミナー

## **The bottom up approach to processing ceramics is not always the best solution**

Lecturer: **Professor Richard M. Laine**

**Dept. Material Science and Engineering,  
Director, Macromolecular Science and Engineering Center  
University of Michigan**

**Date March 7, 2012 10:30~12:00**

**Venue 021 room, ES Building**

Liquid-feed flame spray pyrolysis (LF-FSP) of metal alkoxide and carboxylate complexes dissolved in ethanol generates a wide variety of phase pure single and mixed-metal oxide nanopowders. These nanopowders typically have average particle sizes of 20-60 nm with surface areas of 70-20 m<sup>2</sup>/g and are often single crystals with limited agglomeration and essentially no aggregation. LF-FSP provides routes to nanoparticles with exact compositions for example Y<sub>3</sub>Al<sub>5</sub>O<sub>12</sub>, 2SiO<sub>2</sub>·3Al<sub>2</sub>O<sub>3</sub>, or even single phase materials that are off expected stoichiometry including spinels with compositions of (MO)<sub>x</sub>(Al<sub>2</sub>O<sub>3</sub>)<sub>1-x</sub> (M = Mg, Ni, Co) where x = 0.1-0.3. Efforts to transform these powders to composite ceramic materials with controlled grain size do not necessarily sinter to full density better than mixtures of the individual powders. The reasons for this and several novel results will be discussed.

略歴: 1969年カリフォルニア州立大学化学部卒。1973年南カリフォルニア大学博士号(化学)取得。デラウェア大、UCサンタバーバラ、スタンフォード国際研究所研究員を経て1987年ワシントンテクノロジーセンター研究教授、1990年からミシガン大学物質科学工学部教官。1999年同大教授。Mayaterials 創設者兼CEO、高分子科学工学センター統括者、EXIMOハードコーティング社共同創設者。

**Inquiry: Prof. Umehara (2785)  
Prof. Ju (4672)**