

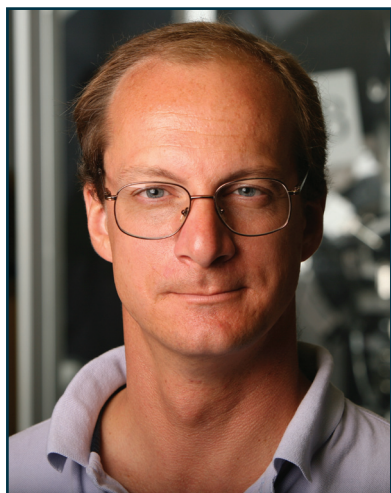


UNIVERSITY OF MINNESOTA  
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# Department of Chemistry

## *Special Seminar*

4:30 p.m. Wednesday, February 16 • 331 Smith Hall



Professor

### **Peter Burns**

Department of Civil Engineering and Geological Sciences  
Department of Chemistry & Biochemistry  
Director of the Energy Frontier Research Centers,  
Material Science of Actinides  
University of Notre Dame

#### *A Family of Uranium-Based Nano-Scale Cage Clusters*

Research interests:

solid state chemistry, mineralogy, and environmental chemistry of uranium as well as the transuranic elements neptunium and plutonium.

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#### **Abstract**

The development of nano-scale control of actinide chemistry is a major objective of the Energy Frontier Research Center Materials Science of Actinides, a Department of Energy Center charged with creation of fundamental knowledge needed to support an advanced nuclear fuel cycle. Toward this objective, we have developed a family of 50 uranium-based clusters with diameters in the 1.5 to 3.5 nm range. These are cage clusters built from as many as 60 uranyl hexagonal bipyramids, in some cases linkers such as pyrophosphate, nitrate, and oxalate groups. SAXS and ESI-MS studies demonstrate that these clusters self-assemble in aqueous solution under ambient conditions. They have been crystallized for complete structure characterization. Factors that determine the size, shape and isomer selection of such clusters will be discussed.

**Host: Professor Laura Gagliardi**  
Refreshments will be served prior to the seminar.