

## 毛河光博士 (Ho-Kwang (David) Mao, Ph. D.) 簡介



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Born: June 18, 1941, Shanghai, China

Citizenship: USA since 1976

■ **Education:**

- Ph.D. (1968), M.S. (1966) University of Rochester, Rochester, NY, USA
- B.S. (1963) National Taiwan University, Taipei, Taiwan, Republic of China

■ **Current Positions:**

Staff Scientist (1972-), Postdoc and Research Associate (1968-72), Geophysical Laboratory, Carnegie Institution of Washington

Director (2009-) Center for Energy Frontier Research Under Extreme Environments (EFree), U. S. Department of Energy

Director (2012-) Center for High Pressure Science and Technology Advanced Research (HPSTAR), China

Einstein Chair Professor, Institute of High Energy Physics, Chinese Academy of Sciences

Honorary Professorship: College of Physics, Jilin University (2001-); Physics Department, Harbin Institute of Technology (2009-)

■ **Honors:**

Foreign Member, The Royal Society, UK, 2008-

Foreign Member, Chinese Academy of Sciences, People's Republic of China, 1996-

Member, Academia Sinica, Republic of China (Taiwan), 1994-

Member, National Academy of Science, USA, 1993-

Fellow, the American Physical Society, 1994-; Fellow, the American Geophysical Union, 1987-; Geochemical Fellow, the Geochemical Society (USA) and the European Association for Geochemistry, 1996-; Fellow, Mineralogical Society of America, 1979

Inge Lehmann Medal, 2007, American Geophysical Union

Balzan Prize, 2005, Balzan Foundation, Italy and Switzerland

Gregori Aminoff Prize, 2005, Royal Swedish Academy of Sciences

Roebbling Medal, 2005, Mineralogical Society of America

Arthur L. Day Prize, 1990, National Academy of Science

P. W. Bridgman Gold Medal Award, 1989, AIRAPT High Pressure International Association

## ■ Research Areas:

### **Chemistry of the Earth's Mantle and Core**

- Phase transition, melting
- Element partitioning
- Oxidation, reduction, hydration, differentiation

### **Deep Earth Geophysics**

- Electronic and magnetic transitions
- Elasticity
- Rheology
- Geodynamics

### **Physics and Chemistry of Giant Planetary Interiors**

- Molecular compounds
- Jovian seismology and interior structure

### **Pioneering High Pressure Technology**

- Multimegabar pressures
- High  $T$  (7000 K) and low  $T$  (0.035 K) at simultaneous high  $P$
- Maximum sample volume at high  $P$
- *In-situ* measurements at high  $P$ - $T$ : Brillouin, Raman, infrared, and optical absorption spectroscopy, electrical conductivity, magnetic susceptibility, NMR
- High  $P$  x-ray diffraction and spectroscopy using synchrotron facilities
- High  $P$  study at neutron facilities

### **High Pressure Condensed-Matter Physics**

- Dense hydrogen
- Pressure-induced metallization
- Free electron gas
- Strongly correlated systems
- Superconductivities

### **High Pressure Chemistry**

- Chemical reactivity and affinity
- Nitrides, and oxides
- van der Waals compounds
- Bonding and stereochemistry
- Transition element chemistry

### **High Pressure Crystallography**

- Ionic radii and atomic coordination
- Amorphous structure
- Pressure amorphization
- Incommensurate structures

### **High Pressure Materials Science**

- Hydrogen storage
- Giant single-crystal diamond growth by CVD method
- Superhard materials
- High-energy density materials
- Nano-materials
- Bio-materials