



# FM-TGMS-MSA SYMPOSIUM ON COPPER AND COPPER MINERALS

## 18th ANNUAL MINERALOGICAL SYMPOSIUM

10:15 A.M. to 1:15 P.M.  
Saturday, February 15, 1997

### PROGRAM

- 10:15–10:25 am Introductory remarks—Symposium Chairperson  
**Dr. Karen J. Wenrich**
- 10:25–10:50 am The chemistry of the secondary copper phosphates and silicates  
**Dr. James L. Sharpe** and  
**Dr. Peter A. Williams\***
- 10:50–11:15 am The mineralogy of the Caledonia mine, Ontonagon County, Michigan  
**Tom Rosemeyer**
- 11:15–11:40 am Chalcocite from the Flambeau mine, Ladysmith, Wisconsin  
**Casey L. Jones** and  
**Dr. Gene L. LaBerge**
- 11:40 am–12:05 pm Occurrence of turquoise group minerals in the eastern United States  
**Dr. Henry Barwood**
- 12:05–12:30 pm New Mexico copper minerals  
**Ramon S. DeMark** and  
**Paul F. Hlava**
- 12:30–12:55 pm Copper minerals in the Grand Canyon, Arizona  
**Dr. Karen J. Wenrich\*** and  
**Wayne C. Leicht\***
- 12:55–1:20 pm The supergene copper minerals of Bisbee, Arizona  
**Richard W. Graeme**
- 1:20–1:45 pm Philolithite, a new mineral from Långban named in honor of the Friends of Mineralogy  
**Dr. Anthony R. Kampf,\* Dr. Paul B. Moore, Dr. Eric Jonsson, Dr. P. K. Sen Gupta, and Dr. George H. Swihart**

### INTRODUCTION

The 18th annual Tucson Mineralogical Symposium, sponsored by the Friends of Mineralogy, the Tucson Gem and Mineral Society, and the Mineralogical Society of America, is to be held in conjunction with the 43rd Tucson Gem and Mineral Show on Saturday, February 15, 1997. Copper and Copper Minerals are the featured minerals at the 1997 Tucson Show, and are the subject of the 1997 mineral symposium.

The word copper comes from the Greek *kyprios*, for the island of Cyprus, where some of the earliest mining of copper occurred. There are over 440 copper minerals reported in the *Glossary of Mineral Species*. The majority of these, particularly the supergene copper minerals, occur in various shades of green or blue. The brilliant blues and green of azurite and malachite and the red of cuprite commonly give them prominence in many minerals collections. Although a green color usually results when copper forms minerals with uranium, some minerals, such as cuprosklodowskite, tend to a yellowish green. With the exception of chalcopyrite, bornite and covellite, the primary and secondary copper sulfides tend to be dull and fine-grained, in shades of black, brown and gray.

Copper ores are found throughout the world, but in the United States when copper is mentioned two areas usually come to mind: Arizona and the Keweenaw Peninsula, northern Michigan. Although Michigan is prominent for its massive native copper, Arizona is equally famous for its high-grade vein deposits, such as Bisbee, and its huge open pit mines of low-grade porphyry copper that have yielded over 54% of the total U.S. copper production. Although spectacular mineral specimens are not, as a rule, found in low-grade sulfide deposits, colorful and exotic minerals have come in gratifying abundance from the oxidized portions of many of these deposits, such as Morenci and New Cornelia (Ajo).

The papers for this symposium discuss various copper deposits across the United States and in Australia.