



**Department of Mechanical Engineering Seminar  
to be held on  
Thursday, December 29<sup>th</sup>, 2022, 11:00**

*in the Seminar Room (117) of the Mechanical Engineering Building (55)  
at the Campus of the Ben-Gurion University of the Negev*

**Shock waves. Macroscopic tool for testing microscopic objects**

**Prof. Eugene Zaretsky**

Department of Mechanical Engineering, Ben-Gurion University  
(Hosted by: Ori Shoshani and Yoav Green)

**Abstract:**

Shock wave in solid is a combination of macroscopic phenomena characterized by micron spatial scale. It appears that such “rough” a tool may be used for experimental determination of physical/mechanical properties of microscopic (nanometer scale) in-material objects. This talk is preceded with a relatively long introduction listing and explaining physical principles on which the suggested technique is based. The introduction is followed by a description of the experimental study of two types of strengthening particles (strengthening precipitates) appeared in beryllium bronze (Cu+2 wgt % Be) after isothermal ageings of different durations. The approach is validated by a reasonable agreement between the shock-wave determined parameters of the precipitates and those directly extracted from Transmission Electron Microscopy (TEM) images.

**Bio:**

Eugene (Zhenia) Zaretsky received his MSc degree in Physics of Metals from Moscow Steel and Alloys Institute (MISIS) in 1973 and his PhD degree in Thermal Physics from USSR Academy of Sciences (now RAS, Moscow) in 1980. Between 1973 and 1990 he has served as a research scientist and a head of research group at Institute for High Temperatures (IVTAN, RAS, Moscow). Moving to Israel in June 1990 he has served one year as a research scientist in Solmex Israel Ltd. Since 1991 he has served as a research scientist and then (1992 - 2019) as Associate and Full Professor at the Department of Mechanical Engineering at BGU. He spent several short (2 to 8 months) periods as a Guest Professor at the Department of Physics, Washington State University (Pullman, WA, USA) and at Tohoku University (Sendai, Japan). Changing in 2019 his status to Professor Emeritus he continues his studies of dynamic response of condensed matter.

**Speaker contact information:**

Email: [zheka@bgu.ac.il](mailto:zheka@bgu.ac.il)

Other contract information : office 08-6477102, mobile 054-6508667.