

## SEMINARIUM RENTGENOWSKIE

Dnia 1.12.2017r. o godz. 11.00, w sali D Instytutu Fizyki PAN, odbędzie się seminarium rtg., na którym **dr Joanna K. Kowalska** z Max Planck Institute for Chemical Energy Conversion, Mülheim an der Ruhr, Germany, wygłosi referat na temat:

### "X-ray spectroscopic studies of FeMo and FeV cofactor of Nitrogenase enzyme"

#### Streszczenie:

The process of reducing dinitrogen ( $N_2$ ) to ammonia ( $NH_3$ ) is essential for producing fertilizers that feed the world's growing population. The cleavage of the N-N bond is achieved industrially in the Haber-Bosch process, while biological  $N_2$  fixation is known to occur at the FeMo or FeV cofactor of nitrogenase. Both processes operate with relatively high efficiency but at different thermodynamic limits: high temperature and pressure (Haber-Bosch) vs. ambient conditions for biological reduction. These significant differences lead to a large interest in understanding the mechanism of biological nitrogen conversion in order to improve future industrial catalyst and processes. In recent years, X-ray spectroscopy brought new insight into the structure of these enigmatic cofactors. The atomic composition was completed by revealing the central carbon in these clusters using X-ray emission spectroscopy (XES). However, numerous questions about the electronic structure remain. Herein, I will give a brief overview of the recent contributions of X-ray spectroscopy to our understanding of the electronic structure of these cofactors. This will include high-resolution Fe and Mo X-ray absorption spectroscopy (XAS) towards the oxidation state distribution assignments as well as X-ray Magnetic Circular Dichroism (XMCD) spectroscopy providing insights into the magnetic coupling in FeMoco and FeVco.

Prof. dr hab. Krystyna Jabłońska