

Dr. Maria Elżbieta Dębowska

PROGRAMM OF THE MONOGRAPHIC LECTURE:

“POSITRON ANNIHILATION PHENOMENON. METHODS OF POSITRON ANNIHILATION SPECTROSCOPY.”

- Positron properties.
- Positron sources.
- Implantation of fast positrons in solids.
- Positron interactions in matter.
- Positron diffusion.
- Positron annihilation.
- Positron annihilation lifetime.
- Positron work function. Reemission of positrons.
- Positronium – the lightest leptonic atom.
- Testing of quantum electrodynamics with use of positronium.
- Positronium in magnetic field.
- Inhibition and quenching of positronium.
- Standard experimental techniques:
 - measurements of angular correlation of annihilation radiation
 - positron annihilation lifetime technique
 - Doppler broadening investigation.
- Application of methods of positron annihilation spectroscopy to studies of
 - electronic structure
 - defects of structure
 - free volume in polymers.
- Low-energy positron beams.
- Application of positron beams to studies of
 - surface
 - distribution of defects in the near-surface region.
- Positron emission tomography.

LITERATURE

1. **A. Oleś, *Metody doświadczalne fizyki ciała stałego*, WNT, Warszawa, 1998.**
2. **J. Dryzek, *Wstęp do spektroskopii anihilacji pozytonów w ciele stałym*, Uniwersytet Jagielloński, Krakow, 1997.**
3. **W. Świątkowski, *Dyfuzja pozytonów w metalu*, Uniwersytet Wrocławski, Wrocław, 1982.**

4. **J. Dryzek, *Badania defektów sieci krystalicznej metoda anihilacji pozytonów*, Raport nr 1679/PS, Instytut Fizyki Jądrowej im. H. Niewodniczańskiego, Kraków, 1994.**
5. **A. Z. Hrynkiewicz in: *Fizyczne metody diagnostyki medycznej i terapii*, PWN, Warszawa, 2000, pp. 102-111.**
6. ***Positrons in Solids*, ed. P. Hautojarvi, Springer-Verlag, Berlin, 1979.**
7. ***Positron & Positronium Chemistry*, eds. Y. C. Yean, P. E. Mallon and D. M. Schrader, World Scientific, New Jersey, 2003.**
8. ***Proceedings of Polish Seminars on Positron Annihilation and International Conferences on Positron Annihilation* accessible at the Section of Applications of Nuclear Physics of the Institute of Experimental Physics of University of Wrocław.**