

# OPTICA APPLICATA

Vol. XXXI (2001) No. 1

PL ISSN 0078-5466

Index 367729

A joint publication of the

INSTITUTE OF PHYSICS,  
WROCLAW UNIVERSITY  
OF TECHNOLOGY,  
POLAND

&

SPIE/POLAND CHAPTER  
in association with  
SPIE—THE INTERNATIONAL SOCIETY  
FOR OPTICAL ENGINEERING

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## **Editorial**

Some fifty years ago, thanks to the initiative and efforts of Professor Cecylia Wesołowska, the investigations of thin film physics began at the Institute of Physics of the Technical University of Wrocław (Poland). In the post-wars reality, research basis in Polish Regained Territories had to be created from the very foundation. Professor Wesołowska contributed greatly to the preparation of essential apparatus equipment, such as vacuum evaporator, spectrophotometer, and optical microscope. The experimental base for interference microscopy we owe to Docent Kazimiera Fulińska. Research in thin metal and dielectric films was at the first stage of an applied character, being an answer to the needs of developing optical industry and scientific investigations done in various fields. Among the achievements of this period one list the method of obtaining interference filters, beam splitters and dielectric layers of high and low refraction indices in the wide spectrum range.

In further stage, the investigations of fundamental character started, dealing with electrical and optical properties of metal films on dielectric substrates and the metal–dielectric film systems. Electric transport phenomena investigated in wide temperature and film thicknesses range took into account both internal and external size effects. Optical investigations permitted to prove the existence of absorption bands dependent on the metal content.

The ellipsometric method was applied in the optical studies of metal, dielectric, semiconductor, implanted and organic films. The optical constants, refractive indices and absorption coefficients were determined for the metals, and the refractive indices and the thicknesses for dielectric and organic films. Experimental examinations of rare earth metal oxide films were also carried out. Different fabrication methods of these films were elaborated and their optical, structural, dielectric and electric properties were examined. Metal–insulator–metal structures were prepared to their studies concerning conductivity, thermally stimulated processes, dielectric response, photoconductivity and the complex impedance diagnostics. Appropriate experimental techniques were introduced.

The investigations of discontinuous metal films on dielectric substrates were also undertaken, including the application of the effective medium theory to explain their optical and electrical properties and statistical description of inhomogeneous films on the basis of the Mandelbrot law. Some of the results of the above mentioned problems are presented in this volume.

*Prof. Ewa Dobierzewska-Mozrzyms*  
Guest Editor