

## 2ND SPRING SCHOOL ON ACOUSTOOPTICS AND ITS APPLICATIONS

Gdańsk-Wieżyca, 24-29 May, 1983

Three years after the 1st Spring School on Acoustooptics and its Applications (*Archives of Acoustics*, **16**, 3 (1981)), which had been held at Wieżyca near Gdańsk, another meeting in this field took place, organized by the Institute of Experimental Physics, Gdańsk University, in cooperation with the Section of Quantum and Molecular Acoustics and Sonochemistry of the Polish Acoustical Society and with support by the Institute of Fundamental Technological Research, Polish Academy of Sciences.

The Honorary Committee included Prof. Dr. Z. JAGODZIŃSKI, Chairman of the Polish Acoustical Society; Prof. Dr. A. KAWSKI, Deputy Rector of Gdańsk University; Prof. Dr. I. MAŁECKI, Institute of Fundamental Technological Research; Prof. Dr. A. OPILSKI, Chairman of the Section of Quantum and Molecular Acoustics and Sonochemistry of the Polish Acoustical Society; Prof. Dr. J. RANACHOWSKI, Institute of Fundamental Technological Research, Polish Academy of Sciences.

The Organizing Committee included Prof. Dr. A. ŚLIWIŃSKI, Chairman; Dr. A. MARKIEWICZ, Secretary; Dr. I. WOJCIECHOWSKA, Deputy Secretary; and Drs. M. BORYSEWICZ, M. KOSMOL, P. KŹWIEK, B. LINDE as members.

The Programme of the School consisted of physical, technical and technological problems related to interaction between light and ultrasound in fluids and solids. The points of interest were bulk, transverse and surface elastic waves interacting with a light beam, particularly a laser light beam.

Although the School took place a year later than originally planned, it lost nothing of its topical value, enjoying a large interest on the part of the experts, not only those who had participated in the 1st School in 1980, but also those who came to this working meeting for the time.

The School provided an opportunity for mutual exchange of knowledge about a large number of specific problems with which this rather narrow field of science is concerned.

70 persons took part in the School 28 lectures and original papers by invited internationally famous experts were delivered. 12 papers were presented in poster form.

The programme of the School included:

**General papers**

1. R. MARTENS, W. HEREMAN (Instytut voor Theoretische Mechanica, Gent, Belgium), *Diffraction of light by ultrasonic waves in the case of oblique incidence of the light, general theory and approximations.*

2. I. GABRIELLI, P. CIUTI, S. ZUGNA (Universite degli Studi di Trieste, Triest, Italy), *Spatial and temporal modulation of a light beam obliquely incident on an ultrasonics beam of rectangular or circular cross-section.*
3. I. GABRIELLI, P. CIUTI (Universite degli Studi di Trieste, Triest, Italy), *Light diffraction by ultrasound: analysis of special temporally modulating arrangements.*
4. K. PATORSKI (Warsaw Technical University, Poland), *Optical harmonic analysis of ultrasonic phase gratings - selected topics.*
5. R. REIBOLD (Physikalisch-Technische Bundestald, Braunschweig, FG-R), *Ultrasound investigation by laser interferometry using quadrature fringe detection.*
6. F. MICHARD (Universite Pierre et Marie Curie, Paris, France), *Local elastic properties investigated through acousto-optical techniques.*
7. J. RANACHOWSKI, J. MOTYLEWSKI (Institute of Fundamental Technological Research, Warsaw, Poland), *Photoacoustic spectroscopy: physical bases and preliminary research in Poland.*
8. M. BASZUN (Warsaw Technical University, Poland), *A method of analysis of SAW in inhomogeneous media.*
9. P. KWIEK (Gdańsk University, Poland), *Diffraction of light by two spatially separated ultrasonic waves.*
10. A. DEFEBVRE (Faculté Libre des Sciences, Lille, France), *Comparison between some theories of Debye-Sears phenomena.*
11. W. HEREMAN (Instytut voor Technische Mechanica, Gent, Belgium), *Acousto-optic diffraction of intense laser light in an isotropic medium (including third harmonic generation).*
12. A. MILEWSKI (Warsaw Technical University, Poland), *Optic electric and magnetic of SAW velocity.*
13. J. KOZŁOWSKI, S. SZAPIEL (Warsaw Technical University, Poland), *The acoustic self-stroboscopy by using an optical cyclic interferometer.*
14. A. ŚLIWIŃSKI (Institute of Experimental Physics, Gdańsk University, Poland), *Acousto-optics in anisotropic media.*
15. A. ALIPPI (Istituto di Acustica "O. M. Corbino", Italy), *Polarization state changes in light interaction with ultrasound.*
16. W. PAJEWSKI (Institute of Fundamental Technological Research, Warsaw, Poland), *The influence of substrate anisotropy on diffraction focusing and reflection of a surface wave.*
17. J. SAPIRIEL (Centre National d'Etudes de Telecommunications, France), *Lattice dynamics of acoustic modes in III-V semiconductor alloys and superlattices.*
18. A. OPILSKI (Silesian Technical University, Gliwice, Poland), *Technology of waveguide formation and methods of investigating waveguides applied to planar acoustooptics.*
19. A. CHYLA, W. KAMIŃSKI (Aviation Institute, Warsaw, Poland), *Acoustic aspects of flow visualisation near tip of propellers and helicopter rotors.*
20. M. SZUSTAKOWSKI (WAT, Warsaw, Poland), *Acoustic fiber sensors.*
21. E. DANICKI (PIT, Warsaw, Poland), *General theory of reflection of surface acoustic wave from periodic metal strips.*
22. G. LOUIS, P. PERETTI (Université Pierre et Marie Curie, Paris, France), *Photoacoustic spectroscopy of organic molecules in gas phase: study in the ultraviolet and infra-red spectra.*
23. A. KOMOROWSKI, W. ZIELENKIEWICZ (IChF, Warsaw, Poland), *Nonradiative relaxation processes in electronically excited molecule in liquid solution by photoacoustic calorimetry.*
24. L. KOVACS, Yu. V. PISAREVSKII, I. M. SILVESTROVA (Research Laboratory for Crystals Physics, Hungarian Academy of Sciences, Budapest, Hungary), *Characterization of TeO<sub>2</sub> single crystals by the acousto-optical method.*
25. E. KOZACZKA, A. CVALINA (WSM, Gdynia, Poland), *Detection and observation of propeller cavitation.*

26. S. AIT AMER, A. BENCHALA, A. DAHEL (City University, London, U.K.), *Visualization and metrology of ultrasonic field.*
27. J. P. WEIGHT, A. F. BROWN, S. AIT AMER (City University, London, U.K.), *High resolution ultrasonic transducer.*
28. I. WOJCIECHOWSKA, A. MARKIEWICZ (Institute of Experimental Physics, Gdańsk University, Poland), *Calculation of ultrasonic field using data obtained in holographic investigation of amplitude distribution throughout an ultrasonic transducer.*

#### Poster form papers

1. M. BORYSEWICZ, A. ŚLIWIŃSKI (Institute of Experimental Physics, Gdańsk University, Poland), *Acoustooptic interaction in nematic liquid crystals.*
2. M. KOSMOL, B. LINDE, A. ŚLIWIŃSKI (Institute of Experimental Physics, Gdańsk University, Poland), *Investigations of molecular processes by acoustooptical methods.*
3. A. MARKIEWICZ (Institute of Experimental Physics, Gdańsk University, Poland), *Calculation of ultrasonic fields.*
4. J. LITNIEWSKI (Institute of Fundamental Technological Research, Warsaw, Poland), *The influence of aberration on a SAM image.*
5. I. MERTA, J. RAFA (WAT, Warsaw, Poland), *Distribution of acoustic wave field in standing wave acoustooptic modulator.*
6. A. CREMISINI, M. DOZIO (Facolta di Ingegneria, Istituto di Matematiche Applicate U. Dinice, Pisa, Italy), *On a new algorithm describing the acoustic wave propagation.*
7. V. F. NOZDREV, S. G. EZHOV, V. A. BALANDING, E. V. GEVORKIJAN (VZMI, Moscow, USSR), *The acoustooptical effect in nematic liquid crystals in the presence of electric field.*
8. S. PATELA, J. KADZIELA, J. RADOJEWSKI (WAT, Warsaw, Poland), *Acoustooptic interaction in ZnO waveguides on oxidized silicon substrates deposited in modified DC sputtering system.*
9. E. SOCZKIEWICZ, *Attenuation of the mean acoustic field in random media and the form of correlation function of irregularities.*
10. O. LEROY, E. BLOMME (Kortrijk, Belgium), *Double Bragg - and Bragg/Normal diffraction of two laser beams by ultrasound.*
11. O. LEROY, J. M. CLAEYS (Kortrijk, Belgium), *Light diffraction by one ultrasonic wave Laplace-transform method.*
12. O. LEROY, E. BLOMME (Kortrijk, Belgium), *Amplitude-time-modulation of a diffracted laser beam by two ultrasonic waves with opposite directions and frequency ratio: 1 : n.*

The sessions involved numerous debates, in addition a programmatic round table discussion was held on the existing criteria permitting distinction between the Raman-Nath and Bragg ranges in the phenomenon of light diffraction by ultrasonic wave. The discussion indicated that these criteria are not sufficient and particularly unreliable in the intermediate case, i.e. in the region between those ranges, where known theories do not ensure agreement with experimental results.

The Proceedings of the 2nd School were published by Publishing Section of Gdańsk University in January 1984, as a separate collection.

The next, 3rd, School on Acoustooptics is expected take place in 1986.

Antoni Śliwiński (Gdańsk)

## INFORMATION ON WINTER SCHOOLS ON MOLECULAR AND QUANTUM ACOUSTICS AND SONOCHEMISTRY AND ON VIBROACOUSTIC HAZARD CONTROL IN INDUSTRY

On 1-6 March, 1984, at Ustroń-Jaszowiec, XIIth Winter School on Molecular and Quantum Acoustics and Sonochemistry and XIth Winter School on Vibroacoustic Hazard Control in Industry were held at Ustroń-Jaszowiec, both organized by High-Silesian Division of the Polish Acoustical Society in cooperation with the Institute of Physics of Silesian Technical University.

The Organizing Committee included Dr. Joachim GMYREK (general management, programme of the School on Molecular and Quantum Acoustics and Sonochemistry), Dr. Bogusław NOSOWICZ (programme and scientific supervision of the School on Vibroacoustic Hazard Control in Industry), Zdzisław JAKUBCZYK, M.Sc. (finances), Dr. Ryszard HNATKÓW (organization), Dr. Zygmunt NICZYPORUK and Dr. Tadeusz PUSTELNY.

In the XIIth Winter School on Molecular and Quantum Acoustics and Sonochemistry, 70 participants took part. Most scientists came from the Institute of Fundamental Technological Research, Polish Academy of Science, Warsaw, Poland; WAT; and Institute of Physics of the Silesian Technical University. There were also representatives of all the scientific centres which work in this field.

In the School 47 papers and communications were delivered. Each of the 6 sessions began with a leading paper on the problems considered in a given session (acoustoelectronics, surface waves, molecular acoustics, quantum acoustics, acoustooptics, sonochemistry and ultrasonic technology). The abstracts of the papers delivered will be published in the 5th volume of the periodical "Molecular and quantum acoustics".

74 participants took part in the XIth Winter School on Vibroacoustic Hazard Control in Industry, including both employees of research and development centres, design offices and industrial plants from all over Poland. The leading problems were those related to the occurrence, measurement, analysis and evaluation of pulsed noises. A review lecture was delivered by Dr. Adam LIPOWCZAN. Another dozen-odd papers on these subjects were presented by representatives of various research institutions and industry. The other group of lectures or communications was devoted to acoustic diagnostics of industrial machinery and facilities and the broadly conceived problems related to noise control. In the School a total of 36 lectures and communications were delivered.

*Joachim Gmyrek (Gliwice)*

## SEMINAR ON ULTRASONIC NONDESTRUCTIVE TESTING

New Delhi 5-6 December, 1983

The Seminar on Ultrasonic Nondestructive Testing was held at New Delhi on 5-6, December, 1983.

The Seminar was organized by the Ultrasonic Society of India in collaboration with the National Physical Laboratory, New Delhi. It was inaugurated by Prof. Rais AHMED, Vice-Chairman, University Grants Commission, New Delhi.

80 delegates, mostly from industries, participated. Besides 12 papers and 4 films, 5 invited lectures were arranged in the seminar over five sessions. Dr. D. SRINIVASAN, Direc-

tor, Naval Physical and Oceanographic Laboratory, Cochin, delivered his lecture on *Acoustic techniques in underwater inspection*, Dr. V. N. BINDAL, President, Ultrasonic Society of India, and Head, Material Division, NPL Delhi, talked on *Ultrasonic inspection of underwater offshore structures*, Dr. A. K. MULLICK, Joint Director, Cement Research Institute, Ballabgarh, talked on *Ultrasonic testing of concrete*, Dr. T. K. SAKSENA, Scientist, NPL, New Delhi, spoke on *The problem of calibration of probes for nondestructive testing* and Mr. J. PRASAD, Head, NDT Centre, Hindustan Aeronautics Ltd, Bangalore, talked about *Training and education programme in NDT*.

Prof. A. K. RAO, Head, Department of Aerospace Engineering, Indian Institute of Science, Bangalore, gave the key note address in the inaugural session of the Seminar and talked on *Acoustic emission*.

In this Seminar, for the first time attention was drawn to the future needs and the magnitude of the problem of underwater NDT inspection in the country. The ultrasonic nondestructive testing technique appears to be one of the most effective methods for such jobs.

In the panel discussion, various problems of utmost need were identified. These included detection and sizing of hairline crack, corrosion testing of steel embedded in concrete, induction of predetermined size cracks etc.

The panel also realized the need of development of various types of probes for different materials such as aluminium alloys and austenitic steel welds. The panel recommended that the NPL should have all types of calibration blocks, reference standards and ultrasonic probes. It made special reference to the report of Electronics Commission, Govt. of India, published in *Electronics Information and Planning*, vol. 7, 1980, pp. 567-599. This report recommended augmentation of testing, calibration and measurement facilities for characterization and standardization of ultrasonic equipment. The panel discussion desired an early implementation of this recommendation.

V. N. Bindal (New Delhi)