

Presentations

Almost ten years ago *Optica Applicata* published a series of papers under a common title *Presentations* in which the particular Polish scientific centres working in optics presented their programs and achievements. It seems to be very interesting to find out how the research carried out at those Institutions developed in the mean time, as well as which new optical centres started their activity and with what results. These questions are expected to be answered in a series of papers, which we are intending to publish. Therefore the new *Presentations* start.

Institute of Physics, Technical University of Poznań

The research work in the Institute of Physics, Technical University of Poznań, Poland, is carried out at three optical laboratories:

1. *Atom Spectroscopy Laboratory* headed by Doc. Dr. J. Dembczyński.
2. *Molecular Physics Laboratory* headed by Prof. Dr. D. Frąckowiak.
3. *Liquid Crystal Physics Laboratory* headed by Doc. Dr. Z. Salamon.

The programme of research:

Atom Spectroscopy Laboratory – The current program of research comprises versatile, both experimental and theoretical examinations of interactions between the electrons in the compound atoms as well as the influence of these interactions on the information about the atomic nucleus in the case when this information is obtained from the measurements of ultrafine spectral lines splitting. The aim of the new experimental examinations is to determine the positions of the fine structure levels in the energy diagram and to measure the ultrafine splitting of these levels. The theoretical examinations are concentrated on parametrization of the suitable interactions by using the method of effective operators.

Molecular Physics Laboratory – The intermolecular interaction examinations for dyes occurring in the photosynthesizing organisms are carried out. These dyes are examined in both anisotropic and isotropic media by applying a number of spectral techniques such as polarized absorption and emission spectra, circular dichroism and magnetic circular dichroism spectra, photoacoustic spectrophotometry and others. Also, the influence of the phase transitions in anisotropic model systems on the dyes spectral properties and deuterized solvent influence on the dyes photochemic whole are investigated. The investigations of the photovoltaic effect in photosynthetic dyes and dye-albumen complexes are continued.

Liquid Crystal Physics Laboratory – The examinations are concentrated on optical properties of liquid crystals doped with fluorizing dyes. The results of the fundamental examinations are exploited to design different kinds of information indicators.

The said laboratories are equipped with the following facilities:

- PGS-2 grating spectrograph with a plane diffraction of 1300 grooves/mm;
- GDM 1000 double monochromator;
- IT 28-30 Pabry-Pérot interferometer (the possibility of working with the pressure tuning as well as of the usage of the etalon together with the spectrograph);
- ILA 120 argon laser;
- UF PS Pabry-Pérot spectrometer with piezoelectric tuning (maximal separation of the dielectric mirrors up to 100 mm);

- Spectrometers for measurement of absorption and fluorescence spectra (with the possibility of measurements of polarized components as well);
- Fluorometers for measurements of extinction time for the excited electron states.

List of publications which appeared in the period 1980-1983:

Atom Spectroscopy Laboratory

1. J. DEMBCZYŃSKI, *Badania struktury atomów złożonych na przykładzie atomów grupy żelaza i bismutu* (in Polish), post doctoral dissertation, Poznań Technical University Press, Poznań 1980.
2. J. DEMBCZYŃSKI, *Fine structure interactions in the first spectrum of the Ti, V, Mn and Fe atoms*, *Physica* **100 C** (1980), 105-123.
3. J. DEMBCZYŃSKI, *Experimental proof of configuration interaction on the hyperfine structure of the ^{57}Fe atom*, *J. Phys.* **41** (1980), 109-118.
4. J. DEMBCZYŃSKI, *High precision measurements of the hyperfine structure of seven metastable atomic states of ^{57}Fe by laser-Rf double-resonance*, *Z. Phys. A* **294** (1980), 313-317.
5. B. ARCIMOWICZ, J. DEMBCZYŃSKI, E. STACHOWSKA, H. SZUBA, *Fine and hyperfine interaction in the second spectrum of bismuth*, *Europhysics Conference Abstracts*, Vol. 4E, p. 51. EGAS Conference, Pisa, 1980.
6. J. DEMBCZYŃSKI, *Effects of the 3d-nd excitation on the fine structure of the iron atom*, *Europhysics Conference Abstracts*, Vol. 4E, p. 50. EGAS Conference, Pisa, 1980.
7. B. ARCIMOWICZ, J. DEMBCZYŃSKI, E. STACHOWSKA, H. SZUBA, *Two-body interaction effects on the hyperfine structure of the bismuth atom*, *Europhysics Conference Abstracts*, Vol. 5A, p. 181. EGAS Conference, Heidelberg 1981.
8. U. JOHAN, J. DEMBCZYŃSKI, W. ERTMER, *Experimental evidence for far configuration mixing effects on off-diagonal H_f s interaction between the $(3d+4s)^{N+2}$ configurations of free atoms*, *J. Phys. A* **303** (1981), 7.
9. J. DEMBCZYŃSKI, B. ARCIMOWICZ, E. STACHOWSKA, H. RUDNICKA-SZUBA, *Parametrization of two-body perturbation on atomic fine and hyperfine structure. The configuration $6p^3$ in the bismuth atom*, *Z. Phys. A* **310** (1983), 27.
10. J. DEMBCZYŃSKI, *New parametrization method of hyperfine interaction. New procedure permitting the exact determination of the nuclear quadrupole moment*. Eighth International Conference on Atomic Physics, Göteborg, 1982, p. B28.
11. J. DEMBCZYŃSKI, W. ERTMER, U. JOHAN, *Parametrization of hyperfine interactions in the iron atom*. Eighth International Conference on Atomic Physics, Göteborg, 1982, p. 29.
12. J. DEMBCZYŃSKI, *Effects of 3d-nd excitation on the structure splitting in configurations $(3d+4s)^{N+2}$ of iron group atoms*. XIV EGAS Conference, Liège, 1982, p. 49.
13. J. DEMBCZYŃSKI, H. RUDNICKA-SZUBA, *New metastable levels in the first spectrum of vanadium*, *Physica* **115 C** (1983), 101.

Molecular Physics Laboratory

1. D. FRĄKOWIAK, Cz. JADŻYN, *Photovoltaic effect of purple membrane*, *Bull. Acad. Polon. Sci., Ser. Sci., Biol.* **27** (1980), 523-525.
2. D. BAUMAN, D. WRÓBEL, *Dichroism and polarized fluorescence of chlorophyll a, chlorophyll c and bacteriochlorophyll a dissolved in liquid crystals*, *Biophys. Chem.* **12** (1980), 83.
3. D. FRĄKOWIAK, K. FIKSIŃSKI, H. PIEŃKOWSKA, *Polarized absorption and emission of chlorophyllin, phycoerythrobilin in stretched polyvinyl alcohol films*, *Photobiochem. Photobiophys.* **2** (1981), 21-34.
4. K. FIKSIŃSKI, D. FRĄKOWIAK, *Comparison of various films used in biophysical investigations as anisotropic matrices*. *Spectroscopy Lett.* **13** (1980), 873-899.

5. D. FRĄCKOWIAK, D. BAUMAN, I. BĘTKOWSKA, *Influence of electric fields on fluorescence quenching of chlorophyll a in nematic liquid crystal matrix*, Photochem. Photobiol. **33** (1981), 779.
6. D. FRĄCKOWIAK, L. B. EROKHINA, Cz. JADŻYN, L. M. SHUBIN, A. Ya. SHKUROPATOV, *Photovoltaic effect of biliproteins, their subunits and aggregates*, Photosynthetica **15** (1981), 36-48.
7. G. E. BIAŁEK-BYLKA, D. WRÓBEL, *Przekazywanie energii wzbudzenia w fotosyntezie*, Zagadnienia Biofizyki Współczesnej (in Polish) **6** (1981), 67, PWN Warszawa-Łódź.
8. G. E. BIAŁEK-BYLKA, A. Ya. SHKUROPATOV, S. I. KADOSHNIKOV, *Excitation energy transfer between β -carotene and chlorophyll a in various systems*. 4-th Conference on Luminescence, Szeged, Hungary, 1982, pp. 183-186.
9. D. FRĄCKOWIAK, H. PIĘNKOWSKA, J. SZURKOWSKI, *Excitation energy transfer between phycoerythrin, phycocyanin and chlorophyllin in PVA films*, Photosynthetica **16** (1982), 496-508.
10. G. E. BIAŁEK-BYLKA, A. Ya. SHKUROPATOV, S. I. KADOSHNIKOV, D. FRĄCKOWIAK, *Excitation energy transfer between β -carotene and chlorophyll a in various systems*, Research Photosynthesis **3** (1982) 241-254.
11. D. FRĄCKOWIAK, D. BAUMAN, M. J. STILLMAN, *Circular dichroism and magnetic circular dichroism spectra of chlorophylls in nematic liquid crystals. I. Electric and weak magnetic field effects on the dichroism spectra*, Biochim. Biophys. Acta **68** (1982), 273-285.
12. G. E. BIAŁEK-BYLKA, *Influence of deuterated solvents on chlorophyll-carotene system*, Studia Biophys. **95** (1983), 65-72.
13. D. FRĄCKOWIAK, D. BAUMAN, *Quenching of chlorophyll a and b fluorescence in the nematic liquid crystal medium*. Acta Phys. Polon. A **62** (1982), 157-164
14. D. FRĄCKOWIAK, D. BAUMAN, K. FIKSIŃSKI, D. WRÓBEL, *Photosynthetic pigments and pigment-protein complexes in anisotropic media*. Photosynthesis, I, Ed. G. Akoyunoglon, Balaban Intern. Sci. Service. Philadelphia 1981, pp. 263-272.
15. A. R. McINTOSH, H. MANIKOWSKI, J. R. BOLTON, *Redox dependence of the green plant photosystem I charge transfer reversibility associated with the electron acceptor A_1 and A_2* . Photosynthesis, II, Ed. G. Akoyunoglon, Balaban Intern. Sci. Service, Philadelphia 1981, pp. 689.

Liquid Crystal Physics Laboratory

1. Z. SALAMON, *The dependence of the fluorescence yield transition from state I to dark on the physical state of membrane lipids*, Bull. Acad. Polon. Sci., Ser. Sci. Biol. **28** (1980), 433-435.
2. Z. SALAMON, A. SKIBIŃSKI, *Solvent effect on spectral properties of the methine dyes*. Z. Naturforsch. **35a** (1980), 378.
3. Z. SALAMON, A. SKIBIŃSKI, *Some properties of dual fluorescence of methine dyes*, Dyes and Pigments **2** (1981), 239.
4. Z. SALAMON, D. BAUMAN, A. SKIBIŃSKI, *Chromatic contrast as a criterium for evaluation of pigmented liquid crystal displays*, Mol. Cryst. Liquid Cryst. Lett. **72** (1981), 27.
5. Z. SALAMON, A. SKIBIŃSKI, *Fluorescence properties of methine dyes in a nematic liquid crystal matrix*, Molec. Cryst. Liquid Cryst. Lett. **65** (1981), 51.
6. D. FRĄCKOWIAK, Z. SALAMON, G. E. BIAŁEK, D. WRÓBEL, *Photosynthetic pigments and the primary processes of photosynthesis*, Polish Ecol. Studies **7** (1981), 301-315.
7. A. SKIBIŃSKI, Z. SALAMON, *Influence of guest molecules on the electric properties of the guest-host liquid crystal cell*, IV Intern. Conf. on Liquid Crystals, Tibilisi 1981, 32.
8. D. BAUMAN, Z. SALAMON, *Effect of dye concentration on the optical properties of the guest-host liquid crystal cell*, IV Intern. Conf. on Liquid Crystals, Tibilisi 1981, 259-260.
9. Z. SALAMON, A. SKIBIŃSKI, *Dual fluorescence of methine dyes*, 4-th Conf. on Luminescence, Szeged 1982, 69.

10. Z. SALAMON, A. SKIBIŃSKI, *Spectral properties of 7H, 9H-quinazoline [3,2-b] benz [d, e] isoquinolin-7-one*. Dyes and Pigments, 1983, in press.
11. Z. SALAMON, D. BAUMAN, *Effect of dyes concentration on the chromatic contrast of pigmented liquid crystal displays*, Molec. Cryst. Liquid. Cryst. Lett. **82**, (1982), 115.
12. Z. SALAMON, A. SKIBIŃSKI, K. CELNIK, *The electric dipole moments of methine dyes*, Z. Naturforsch. **37a** (1982), 1024.
13. Z. SALAMON, A. SKIBIŃSKI, K. CELNIK, *Orientation of the absorption and emission transition moments of methine dyes*, Z. Naturforsch. **37a** (1982), 1027.
14. Z. SALAMON, A. SKIBIŃSKI, *Fluorescence emission of guest molecules as a tool of surface alignment study in nematic liquid crystals*. Molec. Cryst. Liquid. Cryst. Lett. **90** (1983), 205.
15. D. BAUMAN, Z. SALAMON, *The electrooptical properties of the dye liquid crystal cells with the phase transition*, 9-th Intern. Conf. on Liquid Crystals, Bangalore, India, 1982.
16. Z. SALAMON, A. SKIBIŃSKI, *Fluorescence method of the liquid crystal substrate interfacial interactions study*, 9-th Intern. Conf. on Liquid Crystals, Bangalore, India, 1982.

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