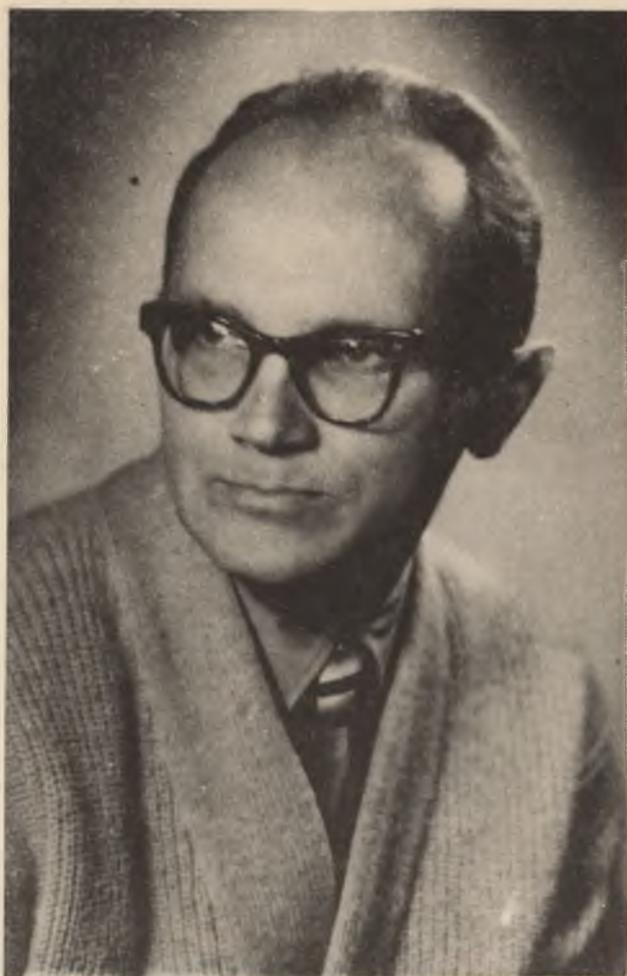


*Redakcja Sekcji Fizyki „Annales Universitatis
Mariae Curie-Skłodowska”, koledzy oraz przy-
jaciele i uczniowie Profesora Mieczysława Su-
botowicza poświęcają Mu niniejszy tom dla
uczczenia 65 rocznicy urodzin.*

*Editors of Physics' Section of the Journal
"Annales Universitatis Mariae Curie-Skłodow-
ska", colleagues, friends and pupils of Professor
Mieczysław Subotowicz dedicate him this vo-
lume on the occasion of his 65th birthday.*



Mr. [Name] is a member of the [Organization] and has been active in its work for many years. He is a graduate of [Institution] and has a degree in [Field]. He is currently employed as [Position] at [Company]. He is a member of the [Organization] and has been active in its work for many years. He is a graduate of [Institution] and has a degree in [Field]. He is currently employed as [Position] at [Company].

Professor Mieczysław Subotowicz
A Biographical Essay on His 65th Birthday
and the 45th Anniversary of His Scientific Activity

There are conventional dates which favour reflexion and a broader look upon the people with whom we have the honour to work. One such occasion is the 65th birthday of Professor Mieczysław Subotowicz and at the same time the 45th anniversary of his scientific activity.

The years of Prof. Mieczysław Subotowicz's work resulted in many scientific, teaching and educational achievements as well as those in the organization and management of science. His ample experience and scientific activity are a guarantee that he will continue his work in all those areas of science. All physicists of our scientific community, especially his disciples, use the achievements of Prof. Subotowicz's work. That is why we shall seek to present a short biographical essay about Prof. Mieczysław Subotowicz.

Professor of Physics, Dr hab. Mieczysław Subotowicz was born on 9 September 1924 in Vilnius, where he graduated from the King Sigismundus Augustus Grammar School, having obtained his high school diploma in 1941 from a Lithuanian school under Soviet rule. He had to sit for the high-school diploma examination again at the Stanisław Staszic Grammar School in Lublin in 1945 since the Polish education authorities did not recognize that diploma.

In 1944 he enrolled at the Department of Natural Sciences of the newly established Maria Curie-Skłodowska University in Lublin. As early as 1946 he was appointed junior assistant at that Department. We can assume that this was the beginning of Professor Subotowicz's fruitful activities in many fields and full of achievements. Since he was young, the Professor has followed Bertrand Russel's terse principle that life is too short for us to be interested in all things, but we should be interested in as many things as our days can only hold. That is why the full presentation of Professor Subotowicz must cover several levels.

SCIENTIFIC ACTIVITY IN PHYSICS

In 1949 M. Subotowicz received his M.Sc, defending his master's thesis titled *Some problems of theoretical physics solved with integral equations* under the supervision of associate Professor Włodzimierz Urbański, PhD, at the Chair of Experimental Physics, Maria Curie-Skłodowska University. He had already been junior assistant and worked

part time for three years as a physics teacher at the Stanisław Staszic Grammar School in Lublin at the request of the principal, T. Lewacki, MSc, who could not find a physics teacher to work in his school.

While working at the Chair of Experimental Physics M. Subotowicz first organized teaching labs and the library, conducted classes, constructed the simplest lab equipment and then took up experimental work in the new and little-known discipline in Poland, which was physics of the solids. His studies were concerned with the investigation of the external photoelectric effect in compound hydrogen-alkaline, antimony-alkaline, sulphur-alkaline, and selenium-alkaline photocathodes. The studies demonstrated their semiconductive nature. At that time it was a pioneering subject and very difficult experimentally because suitable precision apparatuses were not available. In order to measure very weak photocurrents (10^{-16} A), an electrometer had to be built first. Therefore Professor built a quadrant electrometer, a very erratic but also very sensitive apparatus, which he used for his investigations that formed the basis for his doctoral dissertation *Investigation of photoemission of compound cathodes with the method of current-voltage characteristics*. In 1958 Prof. Subotowicz received his PhD in physics. At that time he conducted his experimental work on compound cathodes and surface properties of solids.

Along with those experiments M. Subotowicz took up physics of clouds and precipitations, publishing a monograph on the subject. After this work had appeared he was offered a position with the Institute for Hydrology and Meteorology in Warsaw, which he declined to accept. Another area of his interest produced his works on the theory of multistage rockets (published in the USA), on the physics of outer space, history of rocket development and the Polish contribution to it (artillery general K. Siemienowicz, 1650), studies on the verification of the general theory of relativity through observation of the courses of artificial satellites, popularization of astronautics (two books), popular lectures in physics on the radio and popularization of the achievements of physics (transistors and photo-voltaic cells).

In 1956-1960 Dr Subotowicz worked part time as assistant professor at the Astronomy Lab of the Polish Academy of Sciences in Warsaw and in 1960-1969 at the Department of Fluid Mechanics, Institute of Primary Problems of Technology, Polish Academy of Sciences.

From 1969 Prof. Subotowicz was concerned with theoretical and experimental work chiefly in nuclear physics. Under his supervision a beta thin lens spectrometer and a spectrometer for measuring longitudinal polarization of beta electrons. Measurements were conducted of beta-gamma correlations and of electron polarization. Correction factors in the beta spectrum and other observables were determined in connection with non-preservation of evenness in weak interactions. In 1966, upon submission of the Habilitationsschrift *Investigation of nuclear matrix elements in beta disintegration of some rare-earth elements*, Mieczysław Subotowicz received his postdoctoral degree (Habilitation). Selected studies in the field are contained in items Nuclear spectroscopy will remain a discipline to which Prof. Subotowicz will eagerly return, publishing successive studies.

Beside nuclear spectroscopy, Prof. Subotowicz conducted work in cosmic physics (a new proposition for verification of the general theory of relativity by means of laser impulses emitted by an artificial satellite of the Sun, a theory of relativist multi-stage rockets) studies in the history of science (on Magni and further studies on K. Siemienowicz, and he wrote a large monograph *Astronautics* (PWN, 1960), which comprises the whole of then problems of astronautics.

In 1966 Mieczysław Subotowicz was appointed associate professor then he was deputy dean and finally dean of the Department of Mathematics-Physics-Chemistry, Maria

Curie-Skłodowska University, for 9 years altogether. In 1971 he was appointed professor (ausserordentlicher Professor) and in 1979 — full professor. Since 1970 he has been head of the Department of Experimental Physics, Institute of Physics, Maria Curie-Skłodowska University.

When the Department of Experimental Physics was established, organized from its very beginning by Prof. Subotowicz, the scope of his work broadened. With his assistants and disciples at the fast-developing Department of Experimental Physics he conducts investigations on thin films of metals, semi-metals and semiconductors, their calvanometric properties, classical size effect and quantum size effect, on the optical properties of thin epitaxial films of narrow-band semiconductors, contact difference of potentials measured with the Kelvin method, EPR effect in rare-earth compounds, growth of monocrystals of semi-magnetic semiconductors and studies of their properties of electron tunnelling in junction with normal metals and superconductors. An important part of Prof. Subotowicz's work are investigations in nuclear physics on weak interactions disturbed by beta-gamma correlations and the Mössbauer effect. Numerous studies concern: ion interaction with the solid. Methods were developed of investigating post-implantation effects, crystal defects and their doping. Prof. Subotowicz's achievements in the field were acknowledged by his nomination as Chairman of the 1988 International Conference on Ion Implantation and Ion Beam Interaction with Solids.

In astronautics, astronomy and physics of outer space

As early as the beginning of his scientific work Prof. Subotowicz became interested in astronautics, an exotic subject at that time and more in the realm of fantasy, yet soon to become reality. A third-year student of physics in 1947, he read his first lecture at a meeting of the Lublin branch of the Polish Physical Society, which was titled *On the Possibility and Need to Position Artificial Satellites of the Earth*. He published many studies and articles on the subject, having also included ample reflections in the books *Jest Engines and Space Flights*, *Astronautics* and many others. He returned to the theme many times, having published successive papers and books. Professor's chief interests in the field were cosmological problems, the questions concerning the existence of other civilizations in the Universe and chance of communicating with them (a bibliography of Prof. Subotowicz's studies on the subject to be found in Zbigniew Paprotny's article in this volume).

The history of the development of physics and social consequences of the development of science

An illustration of Prof. Subotowicz's historical interest are the following studies: *Kazimierz Siemianowicz and His Contribution to the Science of Rockets* or *The Most Important Dissertation in Print on the Experimental Proof of Existence of Vacuum*, a study devoted to Walerian Magni (1586–1661) and the Torricelli experiment conducted in the Royal Castle in Warsaw in the presence of King Ladislaus IV by W. Magni in 1647, independently of Torricelli.

ORGANIZATION OF SCIENCE AND TEACHING (EDUCATIONAL ACTIVITIES)

Establishing the Department of Experimental Physics

Under Prof. Subotowicz's supervision the Department of Experimental Physics was established at the Maria Curie-Skłodowska University in 1970. It currently employs 16 academic teachers and some technical staff. Over the last 20 years the following equipment was purchased or built: HV and UHV dusters, apparatus for growing monocrystals with different methods, an up-to-300 keV ion accelerator for implantation, an EPR spectrometer, optical apparatuses, a tunnel spectrometer, installation for helium recovery, which enabled to conduct investigations at liquid helium temperatures, helium cryostats, apparatus for liquid-phase epitaxy, C-V apparatuses and DLTS spectrometers for investigation of decomposition of impurities in implanted semiconductors and their band structure. X-ray diffractometers, RHEED apparatus: and in nuclear physics -apparatuses for investigation of disturbed gamma-gamma correlations and a Mössbauer spectrometer. The Department's Labs were amply equipped in computers. It is Prof. Subotowicz's merit that in his Department research can be conducted on a very high European level. This resulted in numerous doctoral and several Habilitation degrees. Prof. Subotowicz supervised 19 doctoral dissertations and 4 Habilitationsschriften as well as 200 master's theses. The teaching faculty of the Department of Experimental Physics are often hired to work abroad and return with commendation for their qualifications and ability to conduct scientific work.

Cooperation with foreign centers

Prof. Subotowicz contributed to the co-operation of Maria Curie Skłodowska University's Institute of Physics with the Nuclear Institute at Dubna (the Soviet Union), initiated by Prof. W. Żuk. Co-operation began in 1969 and first concerned nuclear spectroscopy of neutron-deficient nuclei of rare earths, which was conducted at the Laboratory of Nuclear Problems. Investigations were carried out in co-operation with the Department of Nuclear Physics, Institute of Physics, Maria Curie-Skłodowska University, headed by Prof. W. Żuk. Since 1980 Prof. Subotowicz and his assistants have been primarily concerned with the inquiries into hyperfine interactions in solids. Research is also conducted on ion beam interaction with solids and on silicide junctions with the RBS methods in the Laboratory of Neutron Physics.

Prof. Subotowicz initiated co-operation with the Concordia University in Montreal, Canada, with the Technische Universität in Clausthal-Zellerfeld, West Germany and with the Universities in Vilnius, USSR and in Jena, East Germany. Department of Experimental Physics has also close contacts with the centers in Munich, Erevan and Grenoble.

Co-ordination of scientific research

Since 1986 Prof. Subotowicz has been co-ordinator, grade II, of the CPBP-01-08-C project devoted to the investigation of surface and surface-layer properties, supervising the work of 9 teams on nation-wide scale. This function is an acknowledgement of his scientific and organizing activities and confirms the importance and the right choice of themes for investigation conducted at the Department of Experimental Physics in Lublin.

Professor Subotowicz is a member of the Physics Committee of the Polish Academy of Sciences and of two of the Committee's Commissions: Commission of Solid and Commission of Nuclear Physics. He is also a member of the Scientific Board of the Department of Physics of Solids, Polish Academy of Sciences, in Zabrze and a member of the Committee for Space Research, Polish Academy of Sciences. In 1966 he was appointed member of two specialist commissions of the International Academy of Astronautics (IAA) in Paris and 1977 — a corresponding member of the Academy, while in 1989 he became its full member. He is also a consultant of the International Astronomical Union (IAU).

Scientific conferences

Prof. Subotowicz organized several scientific sessions. He chaired the Organizing Committees of the following conferences: Man versus Problems of Modern Civilization (Lublin, 25 Oct., 1969); Problems of Environmental Protection (1974); Socio-Cultural Problems of the Development of Science and Civilization, an international symposium in memory of Maria Curie-Skłodowska on the 50th anniversary of her death (Lublin, 31 May to 2 June, 1984); International Conference on Ion Implantation in Semiconductors and Other Materials (Sept. 12-17, 1988). He took part in over 100 congresses both home and abroad, where he read his own papers and those by his assistants (among others he participated in more than 20 congresses of the International Astronautical Federation). He studied and read lectures at the Universities at Louvain, Belgium, in Liverpool (UK), Montreal, Canada, Clausthall-Zellerfeld (West Germany), in Moscow and in the USA.

Scientific societies

In 1954 in one of his articles in the „Problemy” Prof. Subotowicz postulated that the Astronautical Society should be founded.

That same year, together with Olgierd Wołczek, M. Sc., he organized the founding meeting of the Polish Astronautical Society. For many years he has been Vice President of the Central Board of the Polish Astronautical Society. He is also Chairman of the Programme Board of the popularized scientific journal „Astronautyka”, member of the Programme Board of the „Postępy Astronautyki” quarterly, where his articles appear. For many years he was also the editor of the physics section at the *Annales Universitatis Mariae Curie-Skłodowska* and the editor of the „*Folia Societatis Scientiarum Lublinensis*” journal. He is a founding member of the Polish Biophysical Society, and he was Chairman of the Mathematics-Physics-Chemistry Department of the Lublin Society for Sciences. He is also a member of the Mathematical Society, Philosophical Society and of the Polish Authors' Association.

His name is included in the American and European editions of *Who is Who*.

Reviewing activities .

Professor Subotowicz's ample knowledge was often made use of for reviewing purposes at various scientific centers such as the Jagiellonian University, Warsaw University, Adam Mickiewicz University, Poznań University, Łódź University, Wrocław University, Institute of Physics, Polish Academy of Sciences in Warsaw, Institute of Primary Problems of Technology in Warsaw, Medical Academy in Gdańsk, Higher Pedagogical College in Opole, Warsaw Polytechnic, Wrocław Polytechnic, Cracow Polytechnic, Lublin Polytechnic and Institute of History of Science and Technology. Polish Academy of Sciences, Warsaw. For them and first of all for the Maria Curie-Skłodowska University in Lublin

Prof. Subotowicz reviewed 43 doctoral dissertations, 10 Habilitationsschriften, 2 nominations for associate professorships (ausserordentlich Professor) and 6 nominations for full professorship. Prof. Subotowicz conferred degrees on 19 doctors of physics and 4 doctors received Habilitation working under his supervision.

POPULARIZATION

Prof. Subotowicz attaches great importance to popularization of science. He was a lecturer of the Popular Knowledge Society for many years. He is a member of the editorial board of the „Delta”, a mathematical-astronomical-physical monthly, where his popularized scientific articles appear. He himself often appeared on television and on the radio in popularized scientific programmes. While the Soyuz-Apollo flight was televised, Prof. Subotowicz appeared on television with scientific comments. There is an anecdote that in the 1950's, when he was hiking about the Tatras, he was detained by the border patrols near the Polish-Czechoslovakian frontier. While the border services were wondering whether he might not be a foreign spy, he delivered a lecture for the servicemen at the frontier station on the artificial satellites of the Earth, their reconnaissance capabilities and on space flights. He published a total of 280 popularized scientific articles.

We have known Prof. Mieczysław Subotowicz for more than 20 years, first as his students and then his assistants at the Department of Experimental Physics. He commands our respect for his impressive diligence, conscientiousness and broad outlook on many problems of physics or on the borderline between physics and philosophy. We know him as a concerned supervisor of our M.Sc. theses and doctoral dissertations and a co-participant in many conferences at home and abroad. Both in Lublin and elsewhere we could count on his friendly assistance in all questions.

For his scientific, popularizing and organizing activities Prof. Subotowicz has been awarded many medals and orders during his 45-year long career: these include Knight's, Officer's and Knight Commander's Crosses of the Order of Restitution of Poland, the Konstanty Ciolkowski Medal (USSR) and many awards by the Ministry of Science, Technology and Higher Education, State Atomistics Agency and by the University of Maria Curie-Skłodowska, Lublin.

It was not our task to evaluate the scientific work of Professor Subotowicz. We considered it our duty and an honour to write this biography of the scholar and teacher by his disciples, to emphasize Prof. Subotowicz's merits for the physicists in Lublin and in Poland, for the whole academic community in Lublin and all over the country. We include a selection of some of his publications to illustrate the most important problems comprised by the wide scope of Prof. Subotowicz's scientific interest. A separate appendix lists books and manuals in mimeo by Prof. Subotowicz.

Mieczysław Budzyński

Mieczysław Jalochowski