

## PAUL SINGER (1934 - 2005)

Paul Singer, an excellent Israeli theoretical particle physicist, a successful, influential and far-sighted advocate for the sciences in Israel, passed away in February 2005 after a short fight with cancer.

Paul was born in 1934 in Roman, Romania, and immigrated to Israel after graduating from high school. He served in the Israeli army, where he reached the rank of Captain, concurrently completing his first physics degree in 1956 at the Technion – Israel Institute of Technology in Haifa, Israel. After receiving an M.Sc. degree (1958) he obtained his D.Sc. degree (1961) in theoretical physics at the Technion under the supervision of the late Nathan Rosen who co-authored the famous Einstein-Podolsky-Rosen (EPR) paper. He then spent two years at Northwestern University (1961-1963) and a third year at Columbia University (1963-1964), where he joined the group of the young Nobel Prize Laureate T. D. Lee. While he was working with Laurie Brown at Northwestern University a light particle, the  $\eta$  meson, was discovered. In order to explain the large decay rates of the  $\eta$  and  $K$  mesons into three-pions they postulated in a paper published in 1964, a light two-pion resonance state, the “Brown-Singer Particle”, which was afterwards named  $\sigma$  and  $f_0(600)$ . This state became then, and is still today, the subject of theoretical and experimental studies.

In 1964 Paul joined the Physics Department at the Technion as an Associate Professor, and was promoted to Full Professor in 1969. He was practically the first elementary particle physicist at the Technion and was instrumental in building up both the particle theory and experimental groups. From 1990 until his retirement in 2002 he was the incumbent of the Charles Wolfson Chair in Physics.

Paul’s research subjects included muon capture, rare radiative decays of light mesons, kaons,  $D$  and  $B$  mesons and their corresponding baryons, both in the Standard Model and beyond. Among his collaborators are Gery Miller, Eduardo Massó, Lars Bergström, Daniel Wyler and Svjetlana Fajfer. His papers with Eduardo Massó and Lars Bergström on the effect of the top quark in kaon decays were quite influential. A unique aspect of these collaborations was the combination of Paul’s deep knowledge of the pre-QCD methods for studying nonleptonic weak decays and the other authors’ QCD approach. The “BMS parameter” (Bergström, Massó, Singer) is still today being used frequently by experimentalists to parameterize the  $K_L$  Dalitz decay. In recent years, his long and fruitful collaboration with Svjetlana Fajfer and members of her group yielded more than twenty papers on various aspects of  $D$  and  $B$  rare decays. Svjetlana notes that Paul was always keen on connecting theoretical results with experimental measurements. As soon as a calculation was completed Paul was the first to study the feasibility of its measurement. In his most cited 1987 paper, with Nilendra Deshpande, Gad Eilam, Peter Lo and Josip Trampedić, Paul’s deep knowledge of radiative  $K$  decays (e.g., his three papers with Moshe Moshe in the early 70’s) led to the use of radiative  $B$  decays for predicting the top quark mass. Paul was very proud of this prediction when the top quark was discovered in 1994 at Fermilab.

Paul published about one hundred scientific papers and conference talks, he edited two conference books, and co-authored an important report on the Future of Engineering Education. He was a member of the organizing committee of many international workshops and conferences, and a frequent visitor to prestigious places such as CERN, SLAC, Oxford, Los Alamos and Niels Bohr Institute. His graduate students occupy important positions in academia and in research institutes.

During Paul's terms as Chairman of the Physics Department (1969-1972 and 1974-1976) research in the department flourished and expanded in Condensed Matter, Particle Physics, Low Temperature Physics and in other "hot" subjects. As Vice President of the Technion for Academic Development (1976-1980) and Senior Vice President (1990-1994), Paul led the Technion to new heights in research and in teaching. He contributed to the successful absorption of many students and scientists from the former Soviet Union, and was instrumental in defining and executing a long range program for the Technion.

His most important and influential positions were the chairmanships of the ISF – Israel Science Foundation (1995-2000), and of FIRST (Bikura) – Focal Initiatives in Research in Science & Technology (2002-2005). Under his leadership the ISF had turned into the largest provider of funds to basic research in Israel. The ISF budget had more than doubled, to more than fifty million dollars per year. This achievement materialized in an increase in both the number of grants and in the funding per grant, causing a significant increase in the quality of research in all disciplines of science, including the humanities. Novel, innovative, interdisciplinary and even risky subjects received support from the Bikura Foundation. As Deputy Chairman of the Israeli Directorate of the Fourth, Fifth and Sixth R&D European Framework (1997-2005) he advanced the stature of Israel in the European Community, thus increasing the share of Israeli scientists in EC support.

In addition to these positions, Paul was a member and chairman of many important and influential committees at the Technion, in Israel and internationally, such as his membership (2002-2004) in ICFA (International Committee for Future accelerators). In 2003 he was awarded the Rotary International Prize for Advancement of Higher Education in Israel. Despite all his assignments, his heart had always been with physics and he continued to be active in research well after his retirement.

Paul is survived by his wife Yocheved, and by his son Ido and his family. We sorely miss a true friend, colleague, mentor, collaborator and a person of high integrity and honesty. We will also miss his wisdom and sense of humor.