

# The 2013 Israel Chemical Society Prizes and Awards

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There are three main reasons for any scientific organization to bestow prizes and awards, and the Israel Chemical Society is no exception. One obvious reason is our desire to thank and honor well-deserved individuals for their outstanding contributions to science and thereby to the entire humankind. The second reason is to honor the prize awarding organization and augment its reputation by being associated with a growing group of revered scientists.

Yet, the prime reason for awarding prizes is the desire to create role models for the young generation. Prize laureates become heroes not only among their peers and colleagues, but, more importantly, among students and young scientists. By selecting the appropriate winners we define what is important for us in terms of research areas, specific achievements and quality of professional conduct. The prizes define the ideal practitioner, a scientist, a chemistry teacher or a leader of the chemical industry.

Driven by these three intentions the ICS has always devoted much attention and efforts to the selection process, including nomination of candidates, confidential deliberations by many prize juries and the prize ceremonies. Announcing and awarding the prestigious ICS Prizes have always created much excitement and satisfaction among all ICS members and attracted considerable attention worldwide. Although most of the prizes have been awarded during the ICS Annual Meetings, additional award ceremonies take place in conjunction with other events. This account presents the various prizes and focuses on the recent set of prizes, which were announced in 2013 and awarded in 2014.

**The ICS Gold Medal** is the highest recognition awarded by the ICS to Israeli citizens who have demonstrated outstanding contributions to chemistry worldwide. Since 2002 the ICS medal was awarded to 14 scientists, 6 of whom are Nobel Prize laureates. The list includes Ada Yonath (2002) of the Weizmann Institute of Science (WIS), Joshua Jortner (2003) of Tel Aviv University (TAU), Ruben Pauncz (2004) of the Technion, Avram Hershko (Technion, 2005), Aaron Ciechanover (Technion, 2005), Zeev Luz (WIS, 2008), Meir Lahav (WIS,

2009), Leslie Leiserowitz (WIS, 2009), Meir Wilchek (WIS, 2010), Eli Hurvitz (Teva Pharmaceutical Industries, 2010), Dan Shechtman (Technion, 2011) and Raphael D. Levine (2012) of the Hebrew University of Jerusalem (HUJ).

The 2013 Medal was awarded to Michael Levitt of Stanford University and Arieh Warshel of the University of Southern California. They have recently received the 2013 Nobel Prize in Chemistry jointly with Prof. Martin Karplus of Harvard University for the development of multiscale models for complex chemical systems. The Medal award ceremony took place on February 3, 2014 in the Chagall State Hall of the Knesset (Figure 1). Both Levitt and Warshel are Israeli citizens and many members of their extended families who live in Israel attended the award ceremony. The event took place immediately after a special meeting of the Science and Technology Committee of the Knesset, which honored the Nobel Prize Laureates. The Chagall State Hall, which was designed and decorated by the Jewish artist Marc Chagall (1887–1985), features three impressive, colorful Gobelin tapestries that were created in 1965–1969, describing a concise and poetic expression to the fatefulness of the Jewish people. The Chagall State Hall traditionally accommodates many national events, including the Wolf Prize ceremony.

**The ICS Honorable Member** award recognizes an outstanding, long and continuous lifetime contribution to chemistry in the State of Israel and an exceptional service to the ICS. It is presented in the form of a certificate, glass trophy and a golden pin bearing the ICS logo. This is a relatively new award, started in 2012 by bestowing it upon Prof. Emeritus Shalom Sarel (HUJ) who restructured the ICS and was its President in 1960–1964. This year the ICS Honorable Member award went to Prof. Emeritus Shmuel Milon Sprecher (Figure 2) of Bar Ilan University (BIU). The award ceremony took place in February 4, 2014 during the gala dinner of the 79th ICS Annual Meeting.

Prof. Sprecher was born in Vienna, Austria in 1929. He received his B.A. degree in Chemistry and Mathematics at the age of 20, and at the age of 24 he received Rabbinic Ordination by the renowned Rabbi Joseph B. Soloveitchik. He obtained his M.A. and Ph.D. in Organic Chemistry from Columbia University with Prof. William von Egers Doering. In 1955, he founded the department of chemistry of BIU. He focuses his research on organophosphorus chemistry, free radical reactions, and bromine

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**Figure 1.** Professors Michael Levitt and Arieh Warshel visiting the Knesset. Top left: A special meeting of the Science and Technology Committee of the Knesset of February 3, 2014 with (from left) MK Moshe Gafni, Chairman of the Committee, Prof. Arieh Warshel, Prof. Michael Levitt, Prof. Ruth Arnon, President of the Israel Academy of Sciences and Humanities, Prof. Menahem Ben-Sasson, President of the Hebrew University of Jerusalem, Prof. Daniel Zajfman, President of the Weizmann Institute of Science and Prof. Dan Shechtman of the Technion. Other photos: Award ceremony of the 2013 ICS Medal to Prof. Arieh Warshel (Top right) and to Prof. Michael Levitt (Bottom right) in the Chagall State Hall.



**Figure 2.** Left: 2013 ICS Honorable Member Prof. Emeritus Shmuel Milon Sprecher (BIU). Middle: 2013 ICS Prize of Excellence winner Prof. Zeev Gross (Technion). Right: 2013 ICS Excellent Young Scientist Prize winner Prof. Fernando Patolsky (TAU).

compounds. In 1971, he was elected Dean of the Faculty of Natural Sciences and Mathematics, and in 1975, Rector of BIU. He is also known for revolutionizing the teaching of general chemistry, organic chemistry and biochemistry all around the State of Israel. Due to his outstanding and renowned pedagogic skills and modern approach, he was enthusiastically invited to deliver graduate and undergraduate courses at TAU, WIS, Technion, HUJ and Ben Gurion University (BGU). Prof. Sprecher has been teaching for 60 years and continues teaching graduate chemistry to this day. Over 3000 Israeli chemists, including the

author of this article, can claim that Prof. Sprecher has shaped their entire attitude to chemistry.

**The ICS Prize of Excellence.** Since 1999 the prize has been awarded to 29 scientists, all renowned worldwide leaders in various fields of chemistry. The 2013 Prize was awarded to Prof. Zeev Gross of the Technion (Figure 2) for disclosing the large potential of corrole ligands and their metal complexes as mediators for important processes in human health and catalysis. His seminal publication of 1999, which reported on a simple synthesis of corrole ligands, has provided an extremely facile synthetic pathway to novel corroles, and has generated a flurry of research activity in the field of corrole metal complexes. This achievement has transformed the corrole chemistry from a scientific curiosity to a vibrant field, largely due to his pioneering role in demonstrating the relevance of corrole complexes to a large number of important applications in catalysis and in biomedicine. Selected examples include the attenuation of atherosclerosis, diminution of cellular dysfunction and death of insulin producing cells, as well as detection and growth-elimination of breast cancer tumors.

**The ICS Excellent Young Scientist Prize.** Since 1987 the prize has been awarded to 28 scientists either younger than 40 or holding an independent faculty position for

less than 7 years. The 2013 prize was awarded to Prof. Fernando Patolsky of TAU (Figure 2) who has made seminal advances at the interface between nano-electronics and biological systems. He has demonstrated selective electrical sensing of individual viruses, multiplexed detection of cancer marker proteins and sensing the activity of tumor-related enzymes. This approach of medical diagnostics is significantly different from other methods in nano-medicine because it uses electrical means for label-free detection with unprecedented sensitivity. Patolsky has also demonstrated integrated arrays of nanowire transistors with neurons, thus interfacing nanoscience with the human brain. He has already published over 80 research papers and 30 patent applications with over 7,000 citations and an h-index of 38.

**The Tenne Family Prize in memory of Lea Tenne for Nanoscale Sciences.** This prize became possible thanks to an endowment fund donated by the family of Prof. Reshef Tenne of the WIS. The first winner of this prize (2012) was Prof. Uri Banin (HUJ) for inventing new types of semiconductor and hybrid semiconductor-metal nanocrystals and for studying their unique chemical and physical properties for applications in nanotechnology, display devices, lighting and solar energy harvesting. The 2013 prize was awarded to Prof. Hossam Haick (Technion) for his scientific innovation and creative development of nanotechnology-based sensors and diagnostic tools, which have a profound impact as a new approach to non-invasive disease detection. This prestigious prize was awarded by the ICS President and the Tenne family members during the NanoIsrael conference in Tel Aviv in March 24–25, 2014. Prof. Hossam Haick (Figure 3) was born in Nazareth in 1975. After receiving his Ph.D. from the Technion in 2002 and leaving for two postdoctoral research periods in the WIS and at Caltech he joined the Technion in 2006. His research focuses on the development of nanosensors that mimic the olfactory system. These devices are based on the implementation of nano-material arrays, including chemiresistors that employ functionalized nanoparticles or nanotubes and field effect transistors that are based on functionalized silicon nanowires. His analyzer devices have been put to practical evaluation in more than two dozen hospitals worldwide. The nanoarray-based breath test was successfully applied for various types of cancers, chronic and acute kidney diseases, hepatic disease and pulmonary arterial hypertension. Prof. Haick has published over 100 research papers, won prestigious research grants and has been awarded with numerous prizes, including major teaching awards.

**The ICS Prize for Excellence in Chemistry Teaching.** Two prizes are being awarded every year to a senior and a junior teacher (less than 5 years in service) for outstanding achievements in chemistry education at high schools. Since 2002 the prizes were awarded to 12 senior and 6 young teachers. This year both prizes were sponsored by Teva Pharmaceutical Industries Ltd. and were



**Figure 3.** Top: Winner of the Tenne Prize for Nanoscale Sciences Prof. Hossam Haick (Technion). Prof. Reshef Tenne of the WIS and the Tenne family members join Prof. Keinan for the award ceremony. Center: Winner of Prize for Excellence in Chemistry Teaching, Mrs. Anat Feldenkrais (Regional Council Lev Hasharon). Bottom: Winner of Prize for Excellence in Chemistry Teaching for a young teacher, Mr. Eran Shmuel (Rothberg High School, Ramat Hasharon). Both teaching prizes are being awarded by Rabbi Shai Piron, Minister of Education, Dr. Dorit Taitelbaum, Chief Inspector for Chemistry Education, and Prof. Ehud Keinan.

awarded jointly by the ICS President, Minister of education Rabbi Shai Piron, Chief Inspector for Chemistry Education and Dr. Dorit Taitelbaum during the opening session of the 79th ICS Meeting in Tel Aviv on February 4, 2014 (Figure 3).

Mrs. Anat Feldenkrais of the Regional Council Lev Hasharon Center for Education, Culture And Sport Dror received the senior teacher prize for her outstanding contribution to chemistry teaching as a teacher and an instructor on the regional and national levels, and for implementing innovative teaching methods and advanced teaching programs. Mrs. Feldenkrais graduated in chemistry with honors from HUJ. Although she started her career with several years in the chemical industry, she was retrained for teaching chemistry in high schools, and 15 years ago she established the chemistry program in high school Dror. Her contingent enthusiasm and dedication to pupils and colleague teachers made the chemistry program at her school highly demanded. In addition, she serves as an inspiring counselor and instructor of other chemistry teachers.

Mr. Eran Shmuel of the Rothberg High School, Ramat Hasharon received the junior teacher prize for extraordinary devotion to chemistry teaching that produced outstanding students, and for making chemistry a prestigious, highly demanded subject at his school. After receiving his M.Sc. degree in chemistry from BIU he pursued an educational career, teaching high school chemistry and biochemistry. He opened the chemistry program in his school and quickly doubled the number of chemistry students there. He merges chemistry teaching with social and humanistic values, triggering much imagination and curiosity among his students who love his exciting stories, presentations, study tours and lab demonstrations.

**The ICS Prize for Technological Innovation.** This new prize, which is sponsored by the ICL Innovation Ltd., was announced for the first time in 2013 and was awarded at the opening session of the 79th ICS Annual Meeting on February 4, 2014. Prof. Israel Schechter of the Technion (Figure 4) received the prize for developing a new an-



**Figure 4.** Left: Prof. Israel Schechter (left) receives the 2013 ICS Prize for Technological Innovation from Ehud Keinan and Mr. Eyal Ginzberg of ICL (right). Right: Mr. Gil Biran, Pazkar CEO (left), and Dr. Nitsa Galili (right), Pazkar Head of chemistry & Technology, receive the 2013 ICS Prize for the Chemical Green Industry.

alytical technology, named Multiphoton Electron Extraction Spectroscopy (MEES), which is described in a recently granted US patent. Prof. Schechter is a world leader in the fields of laser spectroscopies and their applications in analytical chemistry. His new technology is based on laser multiphoton ionization that provides rich analytical information. A spectrometer based on MEES has proven a powerful analytical tool that works under ambient conditions. The method is very sensitive and has the potential of revolutionizing the detection of explosives and illegal drugs, and can be applied for environmental protection, food analysis and quality assurance. In its scanning mode MEES provides chemical imaging of solid surfaces.

**The ICS Prize for the Chemical Green Industry** is being awarded every year since 2010 to a chemical industry that excelled in environmental protection through significant contribution to minimization of hazardous emissions, such as greenhouse gases and other pollutants, energy saving, and manufacturing of environmentally friendly products. Previous winners of the prize are Paz Ashdod Oil Refinery Ltd. (2010), ICL Industrial Products

(2011) and Makhteshim-Agan Industries (2012). The 2013 prize was awarded to Pazkar Ltd. for their contributions to protection of the environment and for the development of energy saving products. Their most significant achievement in this regard has been the development of InoPaz H2O, a revolutionary green polyurethane product that proves high waterproofing capabilities. The award ceremony took place in the gala dinner during the 79th annual meeting of the ICS in Dan Panorama Hotel, Tel Aviv, on February 4, 2014 (Figure 4). It is the second time that the ICS Prize for the Chemical Green Industry goes to the Paz Oil Group.

InoPaz H2O is a water-based VOC-free, 2-component aliphatic polyurethane liquid membrane for coating and waterproofing. In addition, it offers outstanding energy saving ability via excellent reflectivity and emissivity of solar radiation and, in particular, high UV resistance, long pot life and easy application in one coat. This platform technology is currently leading to additional products under development at the Pazkar laboratories. Pazkar Ltd., a subsidiary of the Paz Oil Group, enjoys 80 years of waterproofing experience since 1934. The company's portfolio includes water-based bituminous liquid membranes, water-based acrylics and hybrid polymers paste, as well as a wide range of bituminous torching and self-adhesive membranes.

**The MCS-ICS Medicinal Chemistry Award in Memory of Barry Cohen.** This international prize, which is awarded annually by the Medicinal Chemistry Section of the ICS, became possible thanks to an endowment fund donated by Teva Pharmaceutical Industries Ltd. Mr. Abraham (Barry) Cohen, a longstanding member of Teva's Board of Directors, who greatly contributed to the development of the company over more than 20 years, passed away on November 22, 2012. From 1982 to 1992, Mr. Cohen served as Senior Vice President of Merck & Co. and from 1977 to 1988 as President of the Merck Sharp & Dohme International Division. After his retirement from Merck in January 1992, Mr. Cohen was active as an international business consultant and a member of several boards, including Akzo Nobel NV, Vasomedical, Inc., Chugai Pharmaceutical Co. Ltd., BioTime, Inc. and Mankind Corporation. The prize was first awarded in 2013 to Prof. Barry Trost of Stanford University for his seminal contributions in designing new synthetic techniques for making more sophisticated pharmaceuticals.

The 2014 prize was awarded to Prof. Richard B. Silverman of Northwestern University (Figure 5) for his outstanding contributions to the field of enzyme inhibition and the development of new compounds for treatment of neurological disorders. The award ceremony took place at the 12th Annual Meeting of the Medicinal Chemistry Section in June 23–24, 2014, at the WIS.

Prof. Silverman received his B.S. degree in chemistry from Pennsylvania State University in 1968 and his Ph.D. degree in organic chemistry from Harvard University in



**Figure 5.** Prof. Richard B. Silverman (Northwestern University) receives the MCS-ICS Medicinal Chemistry Award in Memory of Barry Cohen from Dr. Raphael Nudelman (Teva Pharmaceuticals), President of the Medicinal Chemistry Section of the ICS (center), and Prof. Michael Meijler of BGU (right).

1974. After two years as an NIH postdoctoral fellow at Brandeis University he joined the chemistry faculty at Northwestern University. In 1986 he became Professor of Chemistry, Biochemistry, Molecular Biology, and Cell Biology. Since 2004 he has been the John Evans Professor of Chemistry. He is most known for his invention of pregabalin, a blockbuster drug used to treat epilepsy, neuropathic pain and fibromyalgia, marketed by Pfizer under the trade name Lyrica with USA retail sales nearing \$2 billion. Prof. Silverman has published over 300 papers on

the molecular mechanisms of action, rational design, and syntheses of potential medicinal agents, particularly for neurodegenerative diseases, over 45 patents and 4 books. His long list of prizes and awards includes Fellow of the AAAS, Northwestern University Alumni Association Excellence in Teaching Award, Arthur C. Cope Senior Scholar Award of the ACS, Perkin Medal, the Bristol-Myers Squibb-Edward E. Smisssman Award of the ACS, the Roland T. Lakey Award from Wayne State University, the Sato Memorial International Award of the Pharmaceutical Society of Japan, Fellow of the ACS, and the Hershberg Award for Important Discoveries in Medicinally Active Substances of the ACS.

The ICS Excellent Graduate Student Prize is being awarded every year to a group of six graduate students, one from each of the major research universities. The winners are selected by the teaching committees of the respective universities and the prizes are contributed by the Chairpersons/Deans of the universities during the annual ICS meeting. Thus, the 2013 prizes were awarded during the opening session of the 79th Annual Meeting of the ICS in February 4, 2014 (Figure 6).

Mr. Ariel Afek (BGU) works under the supervision of Dr. David Lukatsky. He aims at better understanding of the molecular mechanisms responsible for protein-DNA recognition. He discovered a novel design principle for protein-DNA recognition, and demonstrated that repeated DNA sequences, which are abundant in the human genome, significantly enhance protein-DNA binding. This design principle sheds light on molecular mechanisms of transcriptional regulation in the living cell and opens up



**Figure 6.** The 2013 ICS Excellent Graduate Student Prizes and the Lise Meitner Prize are being awarded by the Chairs of the relevant departments and Ehud Keinan. Top row from left: Ariel Afek (with Prof. Gabriel Lemcoff, BGU), Assaf Ben-Moshe (with Prof. Gil Markovich, TAU), and Sophia Buhbut (with Prof. Bilha Fischer, BIU). Bottom row from left: Yury Minko (with Prof. Zeev Gross, Technion), Shahar Sukenik (with Prof. Assaf Friedler, HUJ), and David Tsvion (with Prof. Ernesto Joselevich, WIS). Top right: The winner of the Lise Meitner Prize, Eli Kraissler (WIS) with Dr. Miri Karni (the Lise Meitner Minerva center, Technion).

a possibility for a better molecular understanding of complex human diseases, such as cancers and complex genomic disorders. Ariel was born and raised in Jerusalem and received all his degrees from BGU. In addition to his research he contributes significantly to high-school chemistry education in Israel, particularly to the education of gifted pupils of the southern part of Israel.

Mr. Assaf Ben-Moshe (TAU) works under the supervision of Prof. Gil Markovich. He received his B.Sc. in chemistry and biology from TAU and now he is on a direct track to Ph.D. His interests include nanoscale chirality and chiroptical effects in semiconductor and metal systems interacting with organic biomolecules. Assaf has recently shown that he could enantioselectively control the synthesis of nanocrystals made of chiral inorganic crystals, such as mercury sulfide, tellurium and selenium by using chiral biomolecules. This concept should have an impact on various fields, including enantioselective catalysis and mass-production of chiral metamaterials. He is a recipient of the Adams fellowship.

Mrs. Sophia Buhbut (BIU) works under the supervision of Prof. Arie Zaban on the development of new mechanisms to efficiently convert solar energy in photo-voltaic cells utilizing quantum dots. She was born in Israel (1982) and earned her B.Sc. and M.Sc. (cum laude) in Chemistry from BIU. She has published 14 papers, one patent and more than 20 conference lectures/posters. She has been awarded the Adams Fellowship, a BINA scholarship, a BIU President scholarship and the Salti prize.

Mr. Yury Minko (Technion) works under the supervision of Prof. Ilan Marek. He was born in 1984 in Nizhny Novgorod (Russia) where he completed his undergraduate studies in chemistry in 2007 before moving to Israel. He is working on the development of new synthetic methodologies that allow for the asymmetric formation of quaternary stereogenic centers in acyclic systems. Part of these results, leading to an efficient approach to stereodefined trisubstituted chiral enolates by direct electrophilic oxidation of vinyl metal species, were recently published in *Nature*. He won the Sherman Fellowship, the Schulich Excellence Prize for Graduate Students, the Vivian Kohnsberg Award and the Gutwirth Fellowship.

Mr. Shahar Sukenik (HUJ) works under the joint supervision of Professors Daniel Harries and Assaf Friedler. He has studied the effects of different cosolute families on protein processes. A cosolute is any molecule that is excluded from the protein surface, and is thus both ubiquitous and diverse, ranging from electrolytes or small molecules to other non-binding proteins. Shahar has shown that different chemical families of cosolutes exert a stabilizing effect on proteins through different, thermodynamically distinct mechanisms. This difference was found in a variety of protein processes, from folding, through protein-protein interactions and on to amyloid aggregation, and may be a previously undiscovered method by which cells control their proteome. He won

several awards, including the American Biophysical Society's Student Research Achievement Award.

Mr. David Tsivion (WIS) works under the supervision of Prof. Ernesto Joselevich. He obtained his B.Sc. in Chemistry from the Open University while an active pilot in the Israeli Air Force and in 2009 he joined the WIS for a direct Ph.D. track. He pioneered the guided growth of horizontal nanowires with controlled orientations. His results were published in high profile journals, including *Science*, *PNAS*, *Nano Letters* and *ACS Nano*. His work has set the foundation for the massively parallel integration of nanowires into circuits, and was the basis for a recently awarded ERC Advanced Grant.

**The Lise Meitner Prize** for an outstanding work in the field of theoretical and computational quantum chemistry is being awarded annually by the Lise Meitner-Minerva Center for Computational Quantum Chemistry administered jointly by HUJ and Technion. The prize encourages young scientists to engage and excel in computational quantum chemistry and quantum theory. An independent committee chaired by Prof. G. Frenking (Marburg) selects the winner. The 2013 prize was awarded to Eli Kraiser (WIS) who works towards his Ph.D. under the supervision of Prof. Leeor Kronik. He received the prize for discovering the omnipresence of the derivative discontinuity in all approximations to density functional theory and for using it to greatly improve gap predictions in atoms, molecules, and solids. He received his B.Sc. from TAU and M.Sc. (Density-functional calculations in atomic systems) under the supervision of Professors Guy Makov (BGU) and Itzhak Kelson (TAU). Currently he is focusing on the development and evaluation of advanced approximations within density-functional theory, as well as on generalization of existing approximations so as to satisfy exact constraints of many-electron systems. He addressed the long-standing problem of the deviation of the total energy curve of atoms and molecules from the required piecewise-linearity, when varying their number of electrons.

**The Assi Prize** was established in 2008 in an effort to promote excellence in chemistry among high school pupils of the Israeli Arab sector. The initiators, Mrs. Afrah Assi, a chemistry teacher of the Jaljulia High School in the Arab village Jaljulia and Ehud Keinan, aimed at encouraging Arab pupils to compete and win the national Chemistry Olympiad (Chemiada). Assi and Keinan agreed that every Arab pupil who would reach the Chemiada finals (third phase of the Chemistry Olympiad) would be awarded with a generous prize, which became possible thanks to a personal contribution by Afrah Assi and her husband. It was immediately after winning the 2008 ICS prize for an Excellent Young Teacher that Mrs. Afrah Assi insisted on making a personal, unconditional contribution to the ICS. Throughout its entire history of 80 years the ICS has been funded by personal and corporate membership fees as well as sponsorship by leading chemical industry. Thus, the remarkable



**Figure 7.** Left: The Assi Prize is being awarded to Duaa Shamaliya (second from left) and Mimuna Masarwa (middle) by Ehud Keinan, Dr. Dorit Taitelbaum and Mrs. Afrah Assi (second from right). Mrs. Nurit Decalo (middle) and Moshe Yehonathan (right) receive a special ICS recognition from Prof. Keinan for their achievements in the Negev-Nobel project.

personal contribution of Mrs. Assi became the first and so far the only personal contribution to the ICS.

Three Arab pupils won the 2014 Assi Prize: Marah Zuabi of the al-Akliriki (Mutran) high school, Nazareth (12th class, educated by chemistry teacher Halil Abu-Nuphal); Duaa Shamaliya of the Gat Triangle high school (12th class, educated by chemistry teacher Garah Muhamed); and Mimuna Masarwa of the Amal Science and Technology School, Taibeh (12th class, educated by chemistry teacher Dr. Isra haj Yichia).

**Other recognitions of pupils and teachers.** Three high school pupils received a prize of excellence for their final research project: Adiel Mostaki of the Shhakim high school, Naharia (with advisor Lial Sapphire, HUJ), Rima Ganaim of the Science and Technology school, Baqa El-

Gharbiyeh (with advisor Dr. Ihab kabaha) and Illay Hammerschlag of Beith Hinuch Shaar Hanegev (with advisor Gabi Shalev). The latter prize for applied chemistry project is named after the late Itan Peled, one of the victims of the Arad Festival disaster of July 18, 1995. This prize has been contributed by the Peled family and is awarded by Itan's father, Dr. Micky Peled of the ICL-IP/Dead Sea Bromine Group. Two teachers of the Negev-Nobel project received a special ICS recognition: Mrs. Nurit Decalo who established a chemistry program in the city of Dimona and Moshe Yehonathan who established a chemistry program in the city of Eilat. All of these awards to pupils and teachers took place during the annual meeting of the chemistry teachers in March 17, 2014 in the WIS (Figure 7).