Yurko Duda, a physicist like few ones

Last February 11th, being in full summit of his career as a scientist, lamentably doctor Yurko Duda passed away. An outstanding scientist participating in the Molecular Engineering Research Program of the Mexican Institute of Petroleum (IMP), Yurko was persistently collaborating in diverse projects of basic and applied research, as well as in the formation of human resources since March 2001. His theoretical research had an important impact on the experimental design of diverse materials and products developed at IMP: foams, detergents for petroleum, coats, inhibitors-dispersants of asphaltenes, and especially on the adsorption phenomenon of polymers and particles on surfaces. This work, among others, has a direct implication in the development of anticorrosives.

Yurko Duda or Youri Douda, has been recognized nationally and internationally, despite his youth. He was among the most dedicated researchers in the field of condensed matter physics – he thoroughly comprehended the chemical-physics of materials and their technological application. Yurko Duda was born on October 4th, 1967 in a city of Drogobych in Lviv region in Ukraine. Yurko went through his undergraduate studies and master in physics at the Theoretical Physics Department of the Ivan Franko University in Lviv from 1984 to 1991. Later, he carried out PhD studies (1991–1996) at the Institute for Condensed Matter Physics of the National Academy of Sciences of Ukraine. The PhD thesis was dedicated to analytical solutions of the integral equations for associative fluids and, in particular, to dimerizing and polymerizing hard-sphere based models, dimerizing adhesive hard spheres and dimerizing ionic fluids. The obtained solutions have been successfully applied in the studies of the effect of soluble proteins on the properties of inverse micelles, as well as of the effect of polymerization on the structure of liquid sulfur. Right after completing PhD, in collaboration with Eduard Vakarin and Myroslav Holovko, Yurko Duda published a series of papers on the homogeneous and inhomogeneous network-forming fluids with a specific application to the adsorption and percolation phenomena in complex fluids.

In November of 1996 Yurko came to Mexico for a postdoctoral stay with Orest Pizio at the Institute of Chemistry of the National Autonomous University of Mexico (UNAM). Later he moved to the position of titular Professor until 2000. Here is Orest Pizio's recollection of these days: "I still remember his first days in Mexico when he arrived alone, without family at the beginning, and started to work hard to realize his ideas, to learn and to teach. That time we had a wonderful ?island? here, actually a branch of the Institute of Condensed Matter Physics – Andrij Trokhymchuk, Andriy Kovalenko, Yurko Duda and myself, all together working at the Institute of Chemistry of the National Autonomous University of Mexico and speaking Ukrainian like at home inside the group. Yurko devoted his first efforts to the application of integral equations of different kinds to the statistical theory of homogeneous and inhomogeneous fluids, next he moved to computer simulations and later to the interface of basic and applied research by considering several important problems. He reached much success in all of these areas." Just before moving to the Mexican Petroleum Institute Yurko Duda spent half of the year in the United States, working with Walter Chapman at the Rice University. Here is how Walter describes that time: "Yurko came to my group to collaborate on a joint research project between my group and Lloyd Lee's group (then at the University of Oklahoma). Yurko stayed with my group from April 2000 through June 2000. He then joined Lloyd Lee's group for about 3 months and later relocated to Mexico. Yurko and my students used molecular simulation to calculate for the first time the bridge function of fused diatomic molecules. The molecular structure was compared with integral equation theory using a thermodynamically consistent closure. The ultimate goal was to free integral equation theory from limitations in modelling the liquid structure and properties of polyatomic molecules like polymer solutions. At the time, Yurko was also studying non-additive hard spheres and colloidal particle stabilized interfaces. We so enjoyed having Yurko and his family in Houston. I recall they enjoyed the Ukrainian community in Houston and Yurko's son loved the school he attended near Rice." Early spring of 2001 Marcelo Lozada-Cassou invited Yurko to join the Molecular Engineering Research Program at the Mexican Petroleum Institute – the final harbor of his life.

Among the most important contributions by Dr. Yurko Duda there can be pointed out the theoretical description of the formation of associative complexes (dimers, chains and networks) in fluids with chemical reactions; the study of agglomeration and percolation; the study of liquid-liquid and vapor-liquid interfaces; phase diagrams; hydrophobic interactions and the formation of liquid-liquid interfaces in bilayers, micelles and emulsions; the adsorption of complex fluids in surfaces and inside porous materials; the modelling of hydrocarbon adsorption; stability of colloidal dispersions (asphaltenes, resins, polymeric additives, among others); as well as the growth-formation of polymer films at liquid-solid interfaces, with application to coatings and paintings of industrial interest. Up to his last days Dr. Yurko Duda directed four thesis, one of master degree and three of Ph. D's. He also contributed in two patents, a chapter in the book "Molecular Systems: Theory and modelling"(Research Signpost, 2008), as well as a whole of 70 publications in international reviewed journals, which up to the date have been cited about 400 times by other authors. At the moment of his passing away he was very enthusiastic on several new research articles that are still to be completed by his colleagues and will be published soon.

With his untimely decease Yurko leaves an enormous hollow in the professional circle, as well as among his relatives, his wife Janna and children Marko and Nazar Duda; his parents Yaroslav and Orysia Duda; his brother Alexander and his friends and colleagues.

Rest in peace.

"I have known Yurko Duda for almost eighteen years, since he was working on his university diploma. Shortly after graduating from Lviv University he continues working with me as a Ph.D. student. He was my first Ph.D. student and I think I was really lucky to have such a talented and diligent co-worker. Together we have published several papers on the associating fluids. He was very enthusiastic in using the theory we have developed and later on, together with M.Holovko and E.Vakarin published several papers on network forming fluids. These papers are currently often cited in the literature. Though I did not get in touch too often with Yurko after he left Lviv it was always a pleasure for me to discuss scientific problems with him during his short visits to our Institute. I was shocked and very saddened gotten the news of Yurko's unexpected death. This is really hard for me to comprehend, as he was quite young and in the midst of a very productive career."

Yura Kalyuzhnyi,
Institute for Condensed Matter Physics,
Lviv, Ukraine

"We are all shocked and unable to fully realize what has actually happened. I got to know Yurko during his Houston visit. At that time I worked as a geologist for ExxonMobil, and Yurko

and Janna stayed with us for a few days. Since that time we remained very good friends. I recollect spending many evenings discussing some possible implications of his absorption theory to the oil industry. At some point, we were thinking to jointly publish an article in the industry scientific magazine. Yurko is not with us anymore His death is a great loss to the scientific community, to his friends and relatives, to Mexico and to Ukraine .”

Max Vityk,
Shell Exploration and Production,
Kyiv, Ukraine

“I am shocked to hear that Yurko passed away. What a brilliant scientist. Yurko joined my research group for only a short time, but he accomplished so much and inspired all of my students during that time. Yurko was a gifted researcher who shared his time generously with students. He will be remembered as a tremendous mentor to my group.”

Walter G. Chapman,
Energy and Environmental Systems Institute, Rice University,
Houston, USA

“Putting the needs of others first before his own is ”Yura” Duda. A man of principle. This is what he will be remembered as by those who knew him. He was a brilliant physicist but to me he was mostly a dear friend. His sense of humor, love of debate and argument about science as well as life is who he was. He had lived to the full, capturing the love and respect of countless many throughout the twelve years I have had a pleasure of knowing him. He will be loved and forever missed.”

Barbara Hribar-Lee,
University of Ljubljana, Slovenia

“It was real pain to hear that Yurko Duda passed away. Just a few days before that, we (Yurko, Stefan Sokolowski and myself) were pleasantly discussing after dinner time very fresh results that Yurko had obtained from Gibbs ensemble computer simulations of phase equilibria in a square-shoulder square-well fluid model in pores. It was a nice, warm and calm sunset on Saturday evening in Mexico City. Yurko was enthusiastic, full of energy as always, and promised to come back again to talk on the subject. That never happened, unfortunately. All of us around him had benefited from his ideas, strength of his arguments and well-grounded discussions. In spite of much focus on science, in everyday life he was full of love and dedication to his wife and children, guided them cleverly with patience and wisdom. He was a well educated and intelligent person. I feel a tremendous loss because of his death.”

Orest Pizio,
Institute of Chemistry, National Autonomous University of Mexico, Mexico

“I am deeply shocked by such a sudden and untimely decease of my friend Yurko Duda. I met Yurko for the first time in 1992 when we became postgraduate students at the Institute for Condensed Matter Physics. We were working together at the department of Theory of solution

under supervision of Professor Myroslav Holovko. At that time we initiated the development of the integral equation theory for homogeneous and confined associating fluids. It was a real pleasure to work with Yurko. His ability to associate and to find compromises together with his exceptional scientific level were indeed outstanding. Our common studies and extensive discussions on various subjects have grown into warm friendly relations between our families. In 1996 we have defended our PhD's (on the same day, on the 20th of March). Soon after the PhD, Yurko moved to Mexico for postdoctoral studies. Since then, we saw each other only once. It was the summer of 2001, in Lviv. We were discussing all night long, analyzing our present and past, sketching our plans for the future. Despite the geographical separation we continued our personal friendship and scientific collaboration. Quite recently we started a series of works on the confined dilatating systems. Apart from that we had a number of promising common projects with a prospect to meet and discuss, but now all that is left hanging in the havens.

Being a highly intelligent and educated person in various aspects (science, literature, art, philosophy, etc), Yurko was always trying to search for a beauty and harmony in this world. His intelligence, enthusiasm and optimism were always helping people around him. The memory of his impressive personality will always have a strong imprint in my life."

Eduard V. Vakarin,
CNRS, Paris, France

"I was truly sorry to hear about this news. Yurko Douda was a great scientist, good friend, generous and optimistic person. He brought his lovely wife and son Marko to Norman, Oklahoma. I remembered in weekends, we would organize short excursions to see the surroundings of Norman. We went once to the science museum in the city (Kirkpatrick Museum, Oklahoma City). Yurko was intrigued by the physics and astronomy experiments set up in there. He would bring Marko to the museum several times there after, to give Marko a good appreciation of science. He and his wife also invited my wife and me to have dinner at his apartment. He cooked specialties from Ukraine for us, a very kind and hospitable host. He was warm and friendly, and in a good way, happy-go-lucky. He never had any worries, or did not let worries to get the better of him. He made many friends in Oklahoma. He found out a Ukrainian church in Ada. So he would have his family attend services there, so the family could feel at home in a strange country. He related an interesting story from the past: that he was driving in Houston on the highway and had a flat tire. Someone stopped by to offer help. The person also happened to be from Ukraine! What a happy coincidence! What a lucky circumstance!

I respected Yurko, not just because that he was a brilliant scientist, that he truly was; but also a good, kind and energetic person. I am honored to have been among his friends."

Lloyd L. Lee,
Los Angeles, California