

From 1999 to 2008: Collaboration is the Best, Namely in IMS

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I came in IMS-Okazaki for the first time in the Winter of 1999, as a visiting scientist. After my returning then back to Bulgaria, I was approved by IMS to get a visiting professor position for another seven months, which started from September 1st 1999, including the Millennium. I would like to share my impressions from the IMS researchers and from the level of science in Okazaki, that this is quite active place with National Institutes which follows the most contemporary topics of the natural science. Especially, the IMS has also Laser Research Center, computational center and all facilities in order to support the high quality research on the most perspective and applied projects in the modern molecular science.

When following the progress of Photo-Molecular Science Department in IMS, I obtained a JSPS fellow position and I came again in June 2007 when I joined the group of Professor Yasuhiro Ohshima. Before, in 1990 I was awarded of Doctor of Science (DSc) degree in Bulgarian Academy of Sciences, Sofia, Bulgaria. My DSc thesis was devoted to Nonlinear Laser Spectroscopy of new type of resonances in atoms, molecules and solids. Such experience allows me to be engaged with the research activity in Photo-Molecular Science group of Prof. Ohshima, which is mainly connected with high-resolution coherent spec-



troscopy of molecules. For Long-term of JSPS fellowship program starting from June 2007 up to April 2008, we performed several academic activities.

My research was mutual with Prof. Ohshima as well as with all members of his group, which includes theoretical and experimental work together. The high level of the science in this group allows solving the problems. The first activity corresponds to experiments on dispersion compensating of injection seeded optical parametric oscillator. When using a pair of walk-off compensating crystals, we can avoid the apparent inter-crystal phase shift and we measured a substantial increase of the parametric signal.

Next activity in IMS in 2007-2008 is the optimizing the powerful coherent UV source for laser spectroscopy of benzene molecules. We use in experiment a simultaneous phase-matching on both polar and azimuthal angles of SHG in LBO crystal, which is quite preferable when giving substantial SHG efficiency increase from the fundamental 789 nm to double frequency at 394.5 nm. Next step of nonlinear frequency conversion is the 3rd harmonic generation in BBO crystal at 263 nm. The experimentally obtained ultraviolet (UV) radiation at 263 nm for cascade 3rd harmonic generation is directly used for laser spectroscopy of benzene molecules.

We performed in IMS also experiments on dynamics of femtosecond (fs) pulses propa-

gation. Recently, the progress in ultrafast lasers has opened up the possibility of quantum control on molecular processes and quantum manipulation of molecular motions. Thus, study of dynamics of fs pulses propagation is of great importance. The obtained experimental results give a new interpretation of the transient dynamics of fs propagation and non-stationary phenomena with linear stability and unexpected reduced diffraction in dispersive nonlinear media as well as in dispersion-less media.

The program of Prof. Ohshima group includes also scientific seminars of high level. This Photo-Molecular Science group is quite open for contacts on national and on international projects, involving foreign scientists. This gives advantages in exchange of new ideas and topics of perspective research. I would like to note, that all facilities in this department and totally in IMS are quite impressive, due to the new experimental equipment. There is very stimulating and favorable atmosphere in Prof. Ohshima group for most efficient mutual work – experimental and theoretical. Such circumstances in the Laboratories of IMS give warm conditions which are conducive to working here.

Besides, my colleagues in IMS and all members of the group helped me to visit some remarkable sight-seeing in Okazaki and in its region. Okazaki is nice city with pleasant landmark and eminent shrines and history. It is very quiet and good place to live and to work in this city.

Further, I would like to continue the scientific collaboration with IMS, in order to have next and more contacts with Department of Photo-Molecular Science and with IMS researchers.

I will deeply acknowledge my host Professor Yasuhiro Ohshima

for his hospitality and kind reception, for his great support in performing our mutual research work in IMS. His interesting project gives important scientific problems and due to our further collaboration we would be able to make new

contributions in developing of contemporary research work.

I am very grateful also to all members of IMS, and to the Department of Photo-Molecular Science for the scientific contacts and discussion, for ensuring the

best collaboration of the work. All nice traditions of the National IMS in Japan make strong stimulation for further scientific exchange and further progress in molecular science.

外国人研究職員の

印象記 02

Good memories of the Institute for Molecular Science

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It is a pleasure to write my impression of IMS in Okzaki. My stay at the IMS started at spring 2006. It is two years science research in Professor Tsuneo Urisu group as a postdoc. There are a lot of good memories and favorable impression.

There are many high quality speech and symposiums in IMS given by representative scientist in the world, with whom we can have the interesting discussions. The collaboration and communication between different research groups have been established. These groups are not only in IMS or Japan, but also in many other countries. There are regularly seminars in every group, and many chances to take part in the conferences. The facility of library in IMS is well equipped. It is easy to find any paper or book what we expected. The staff in library will copy for us from other libraries if some journals are limited in IMS library. These scientific environments of IMS are of great benefit to researchers. This was very help-

ful to keep our work excellent and fruitful.

I was really impressed by the great effort of every group member. They work very hard, especially Professor Urisu. His scientism to seek the truth and work with perseverance affected me deeply. Furthermore, our group is active and cooperative, and everybody is warm and accommodating. Dr. Ryugo Tero is friendly young chemist and specializes in the preparation in biomembrane and AFM operation. I have learnt a lot from him. My work would not go on well without their precious helps. I would like to thank all the group members.

I spent enjoyable Japanese life for two years. There are many traditional festivals all the year, at that time we can watch traditional entertainments, such as cherry blossom, fireworks, and cultural festivals and so on. These activities were held at the Otokawa river banks, where is an important place in Okzaki. Okzaki is in beautiful surroundings. It is very suitable to live due to it is always very quiet and clean everywhere. I was surprised at many kinds of flowers in every season, and every family has the lovely and neat garden, although some of them are small. I like to walk along the river



or in the parks after one working week. Moreover, Japanese are friendly and patient, you could feel it deeply in the bank, station, restaurant, supermarket, even on the street.

NINS has the special facility, Mishima lodge, which is very few for other institutes. It is very convenient for foreigner researches, avoided many troubles in renting the house. Moreover, it is good accommodation, where is always quiet and clean, and surrounded by fresh flowers and flourished plant. Gymnasium is also equipped in IMS. We could take exercise, and play table tennis, and play the piano at any time including the weekend.

I would like to say thanks to Professor Urisu for giving me such a chance to work in IMS. I also appreciate all the peoples who helped warmly me, and best wish to you. I shall remember and miss these days living in Japan.