

Item 16.1: IUPAC Prize

The IUPAC Prize for Young Chemists was established in 1999 “to encourage outstanding young research scientists at the beginning of their careers.” The Prize has been given annually during 2000-2003 to four or five scientists for the most outstanding Ph.D. thesis in the general area of the chemical sciences, as described in a 1000-word essay. The Prize consists of a cash award of USD 1000 and travel expenses to the next IUPAC Congress. Because the quality of applications has been high, a number of additional Honorable Mention awards have been made each year, consisting of USD 100 and a copy of the IUPAC “Gold Book.” Applications are evaluated by a committee of members of the Bureau, chaired by the Past President.

Council approved this program in 1999 for a trial period of four years. The IUPAC Officers and the Bureau have considered the program to be highly successful. It has attracted a significant number of applicants – 59 in 2000, 29 in 2001, 40 in 2002, and 34 in 2003 – almost all of very high quality. Each year the award committee has struggled to select the most meritorious candidates. The following pages list the winners and honorable mention awardees for 2000-2003. The range of chemistry covered by their theses is impressive.

The program has resulted in nine excellent young scientists attending each Congress and presenting posters. In 2002, each of the four awardees was invited to write an article for *Pure and Applied Chemistry*. All four responded with excellent review articles, some in collaboration with their mentors or others. The award of the Prize has been the highlight of the opening ceremony for the Congress in Brisbane and in Ottawa. The awards have been publicized in national chemistry news magazines and have thus brought favorable attention to IUPAC and to the young awardees. The cost of the program has been approximately USD 52 000 per biennium, supported by income from the IUPAC endowment fund.

Statistics for the program are summarized in the table on a following page. Over the four years, 34 of 162 applicants have received awards or honorable mentions. In the table the geographic listing refers to the country in which the doctoral degree was awarded, not the citizenship of the applicant. Applicants have received their Ph.D. degrees in 36 countries, all NAOs or Associate NAOs. Of these, 15 countries were the site of winners or honorable mention awardees.

Council is requested to authorize the continuation of this program at its current level [four awards per year plus an additional award in the odd-numbered years limited to the host country of the Congress] without a time limit but subject to a status report at each Council meeting. In future years:

- Each NAO is asked to continue to publicize the program to ensure that high quality applications are encouraged over a wide geographic range. An overall annual applicant pool of about 50 is desirable. It would be difficult to cope with a very large number of applications; maintaining the quality of applications is paramount.
- As a larger number of awardees develops, the Secretariat should track the professional status of awardees to determine the impact of the program.
- Efforts should be made at an appropriate time to solicit financial support for the program from chemistry-related industrial firms.

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2003 Prize Winners

Roman Boulatov, Stanford University, CA, USA;

"Synthesis and Reactivity of Metalloporphyrins in (A) Biomimetic Studies of Terminal Oxidases and (B) the Preparation of Novel Heterodinuclear Multiple Metal-Metal Bonds."

Gonzalo Cosa, University of Ottawa, Canada;

"Mechanism of Degradation of Pharmaceutical Products and Analogues, and Development of a Novel Fluorescence Technique for DNA-damage Detection."

Martin Trent Lemaire, University of Victoria, Canada;

"Synthesis and Coordination Chemistry of Chelating Verdazyl Radicals."

Christoph Schaffrath, University of St. Andrews, Scotland;

"Biosynthesis and Enzymology of Fluorometabolite Production in Streptomyces Cattleya."

Kaihsu Tai, University of California, San Diego, CA, USA.

"Simulations of molecules and processes in the synapse."

2003 Honorable Mention Awards

S. Nagendran, Indian Institute of Technology-Kanpur, Kanpur, India

"N-Bonded Silanediols and Organostannoxanes: Stannoxanes as Scaffolds for Multi-ferrocene and Multi-porphyrin Architectures."

Vincent Semetey, Louis Pasteur University, Strasbourg, France

"N,N'-linked urea oligomers: synthesis, conformational studies and self-assembly properties."

Lei Wang, University of California in Berkeley, CA, USA

"Expanding the Genetic Code of Escherichia coli."

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2002 Prize Winners

Jeroen J. L. M. Cornelissen, University of Nijmegen, The Netherlands

"Polymers and Block Copolymers of Isocyanopeptides -Towards Higher Structural Order in Macromolecular Systems."

Jinsang Kim, Massachusetts Institute of Technology, Boston, MA, USA

"Supramolecular Assemblies of Conjugated Sensory Polymers and the Optimization of Transport Properties."

Stefan Lorkowski, University of Münster, Germany

"Differential Gene Expression in Human Macrophages During Foam Cell Formation."

Simi Pushpan, Indian Institute of Technology, Kanpur, India

"Core Modified N-confused and Expanded Porphyrinoids: Syntheses, Characterization and Photodynamic Activity."

2002 Honorable Mention Awards

Christopher J. Kuehl, University of Utah, USA

"Supramolecular Organometallic Architecture via Self-Assembly."

Gábor Lente, University of Debrecen, Hungary

"Reactions of the Iron (III) Hydroxo Dimer with Inorganic Ligands."

Shinsuke Sando, Kyoto University, Japan

"Rational Design of DNA Binding Molecules."

Izabela Tworowska, Polish Academy of Sciences, Lodz, Poland

"Chemistry and Stereochemistry of Nucleosidyl Phosphorofluoridates and their Structural Analogues."

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2001 Prize Winners

Soumyakanti Adhikari, University of Mumbai, Mumbai, India

"Radiation chemical studies on biological and other important molecules in micelles, microemulsions and aqueous solutions"

Michelle Louise Coote, University New South Wales, Sydney, Australia

"The origin of the penultimate unit effect in free-radical copolymerization"

Stephan Link, Georgia Institute of Technology, Atlanta, GA, USA

"Spectral Properties and relaxation dynamics of surface plasmon electronic oscillations in gold and silver nanodots and nanorods"

Teri Wang Odom, Harvard University, Cambridge, MA, USA

"Electronic Properties of single-walled carbon nanotubes"

Paolo Samorí, Humboldt University, Berlin, Germany

"Self-assembly of conjugated (macro)molecules: nanostructures for molecular electronics"

2001 Honorable Mention Awards

Volker P.W. Boehm, Technische Universität München, Germany

"Catalytic Activation of Aryl Chlorides in Heck-Type Reactions"

Erwin Kessels, Eindhoven Univ. of Technology, Netherlands

"Remote Plasma Deposition of Hydrogenated Amorphous Silicon: Plasma Processes, Film Growth, and Material Properties"

Angelos Michaelides, The Queen's University of Belfast, Northern Ireland

"Towards an understanding of simple reactions in Heterogeneous Catalysis"

Janne Ruokolainen, Helsinki University of Technology, Finland

"Supramolecular Concepts for Self-Organized Polymeric Nanostructures"

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2000 Prize Winners

Alberto Credi, Università di Bologna, Italy

"Molecular-Level Machines and Logic Gates"

Hiroyuki Isobe, University of Tokyo, Japan

"Design and Synthesis of DNA Binding Organofullerene"

Vijaya J. Patil, National Chemical Laboratory, Pune, India

"Electrostatically controlled formation of nanocomposite thin films with organic matrices"

Chandra Saravanan, University of Massachusetts, Amherst, MA, USA

"Physical chemistry of organic molecules in nanoporous materials"

2000 Honorable Mention Awards

Tamara V. Basova, Institute of Inorganic Chemistry, Siberian Branch of the Russian Academy of Science, Novosibirsk, Russia

"Physical chemical and Raman spectral investigation of phthalocyanines of copper and aluminum and their thin films"

Olivier P. Haefliger, Swiss Federal Institute of Technology (ETH), Zürich, Switzerland

"Development of two-step laser mass spectrometry as a competitive analytical-chemical method"

Harri Hakala, University of Turku, Finland

"Preparation, Categorization and Hybridization Properties of Oligodeoxyribonucleotide Coated Microparticles"

Mallela M. G. Krishna, Tata Institute of Fundamental Research, Mumbai, India

"Dynamics of Fluorescent Probes in Biological Systems"

Joselito P. Quirino, Himeji Institute of Technology, Kamigori, Japan

"On-line concentration of analytes in electrokinetic chromatography"

Summary of Data for IUPAC Prize: 2000-2003

NAO	2000			2001			2002			2003			Total 2000-3			
	A	W	HM	A	W	HM	A	W	HM	A	W	HM	A	W	HM	W+HM
Argentina	2			0			0			0			2	0	0	0
Australia	1			3	1		0			0			4	1	0	1
Austria	1			1			0			0			2	0	0	0
Belgium	1			0			1			0			2	0	0	0
Bulgaria	0			0			2			0			2	0	0	0
Canada	3			0			0			2	2		5	2	0	2
China/Beijing	2			1			0			0			3	0	0	0
Czech Republic	1			0			1			0			2	0	0	0
Denmark	0			0			1			0			1	0	0	0
Egypt	3			0			0			1			4	0	0	0
Finland	1		1	1		1	0			0			2	0	2	2
France	0			1			1			2		1	4	0	1	1
Germany	2			5	1	1	2	1		1			10	2	1	3
Hungary	2			0			3		1	0			5	0	1	1
India	6	1	1	5	1		7	1		14		1	32	3	2	5
Ireland	0			0			1			1			2	0	0	0
Italy	2	1		1			1			1			5	1	0	1
Japan	3	1	1	0			3		1	1			7	1	2	3
Netherlands	0			1		1	1	1		0			2	1	1	2
Pakistan	1			0			0			0			1	0	0	0
Poland	3			0			4		1	0			7	0	1	1
Portugal	1			0			0			0			1	0	0	0
Romania	1			0			0			0			1	0	0	0
Russia	2		1	1			1			1			5	0	1	1
Singapore	2			0			0			0			2	0	0	0
South Africa	0			1			0			0			1	0	0	0
Spain	0			0			1			0			1	0	0	0
Sri Lanka	0			1			0			0			1	0	0	0
Sweden	0			0			2			0			2	0	0	0
Switzerland	3		1	0			0			0			3	0	1	1
Thailand	0			0			1			0			1	0	0	0
Turkey	7			0			0			1			8	0	0	0
UK	0			3		1	2			3			8	0	1	1
Ukraine	7			0			0			0			7	0	0	0
USA	2	1		4	2		5	1	1	5	3	1	16	7	2	9
Yugoslavia	0			0			0			1			1	0	0	0
Total	59	4	5	29	5	4	40	4	4	34	5	3	162	18	16	34
Total NAOs/ANAOs	24	4	5	14	4	4	19	4	4	13	2	3	36	8	12	15

Item 16.2: Conferences in Developing Countries and on New Directions in Chemistry

Following a report from the Conference Policy Development Committee [CPDC], the Bureau agreed in September 2002 to refocus two existing programs that provide financial support to international chemistry conferences. No formal action is required by the Council, but Delegates should be aware of the new approach and may wish to make suggestions to improve the programs.

Conferences in Developing Countries

In 1999, Council approved a program of financial support for conferences in developing and economically disadvantaged countries, with a biennial budget of USD 40,000. The program was intended “to stimulate the scientific activities of developing countries and to encourage young scientists who rarely have the opportunity to attend international conferences in countries far from their own countries.” In the four years of operation, ten conferences have been supported with funds of USD 4000 to 10,000 each, as indicated in the following list.

In analyzing this program, along with all other programs for IUPAC support and sponsorship of conferences, the CPDC recognized that the conferences that had received support were all of high quality, and that the funds were undoubtedly useful to the conference organizers. However, the CPDC noted that almost all applications for support came from conferences that are part of a well established international series, in which the next conference happened to be held in an eligible country. The budgets for the applying conferences averaged USD 72,000. The IUPAC contribution, while significant, rarely appeared to play a crucial role in the organizers’ ability to hold the conference, and IUPAC has become one of many sources of funds. The number of applications dropped from a high of nine for conferences to be held in 2002 to five [all from one country] in 2003 and five [two from ineligible countries] in 2004.

The CPDC concluded that the goal of supporting conferences in developing countries is excellent, but that IUPAC’s limited funds could be better employed. The CPDC recommended and the Bureau approved a plan to refocus this program in several ways:

- Try to relate the supported conferences to programs within the Divisions and Standing Committees. Applications for support will come from these IUPAC bodies, rather than conference organizers directly.
- Aim support to conferences that have some innovative aspect that relates to IUPAC interests and/or to benefits for the host country.
- Provide part of the support funds in the form of *IUPAC Lecturers* – senior scientists who agree to speak at a conference and preferably also to visit nearby universities or other institutes for seminars, discussions and development of potential long-range collaborations.
- Expand eligibility to Associate NAOs, as well as NAOs, in order to broaden contacts with scientists in developing countries.

The refocused program will require additional proactive efforts on the part of IUPAC Divisions and Operational Committees, but there should be significant benefits to IUPAC

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in fostering a more coherent activity and in receiving greater recognition for its investment.

Conference on *New Directions in Chemistry*

A pilot program, with a budget of USD 25,000 per biennium was established in 1999 at the initiative of President Jortner to permit IUPAC to initiate occasional conferences on cutting-edge research topics as a complement to the Union's sponsorship of a number of well known series of conferences in established fields. The first Conference on *New Directions in Chemistry* was held in 2001 in Hong Kong and was devoted to nanostructure chemistry. It was highly successful and in some ways presaged the current strong interest and support for research in nanotechnology. A second conference on a similar topic was held in 2003 in Bangalore, again with great success.

The CPDC recommended and the Bureau approved the continuation of this program, but on a more formal basis with clear guidelines and with applications made by Divisions and Standing Committees for support of conferences in innovative areas. As detailed in the President's report, support for two such conferences has been provided so far this year.

Funding and Selection of Conferences

The CPDC recommended and the Bureau approved consolidation of the funding for these two programs into a USD 65,000 allocation, as included in the proposed budget for 2004-2005. The Project Committee was charged with review of applications and funding decisions.

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Conferences in Developing and Economically Disadvantaged Countries

<u>Conference</u>	<u>Location</u>	<u>Award</u>
<u>2001:</u>		
International Symposium on Green Chemistry	India	\$10 K
3 rd IUPAC International Conference on Biodiversity	Turkey	\$5.5 K
<u>2002:</u>		
XIX IUPAC Symposium on Photochemistry	Hungary	\$10 K
European Molecular Liquids Group Annual Meeting: "Novel Approaches to the Structure and Dynamics of Liquids: Experiments, Theories, Simulations"	Greece	\$7 K
10 th International Symposium on Solubility Phenomena	Bulgaria	\$7.5 K
<u>2003:</u>		
3 rd International Symposium on Separations in the BioSciences	Russia	\$6 K
XVII Mendeleev Congress on General and Applied Chemistry	Russia	\$10 K*
<u>2004:</u>		
International Conference on Biodiversity and Natural Products: Chemistry and Medical Applications (combining ICOB-4 and ISCNP-24)	India	\$5 K
4 th International Symposium on Chemistry and Biological Chemistry of Vanadium	Hungary	\$4 K
4 th International Conference of the Chemical Societies of the Southeastern European Countries on Chemical Sciences: Visions, Challenges and Solutions	Yugoslavia	\$6 K

* Includes funds for meeting to recruit new NAOs