

21st International
CODATA Conference

PROCEEDINGS

**Scientific Information
for Society –
from Today to the
Future**

October 5 – 8, 2008
Kyiv, Ukraine

Organizers

National Technical University of Ukraine "Kyiv Polytechnic Institute"
Committee on Data for Science and Technology (CODATA)
of the International Council for Science
In partnership with National Academy of Sciences of Ukraine

All papers are published on responsibility of the authors and after positive reviewing by the CODATA-21 Programme Committee.

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Foreword
21st International CODATA Conference
Scientific Information for Society – from Today to the Future
CODATA Proceedings

CODATA, since its conception, over 40 years ago has evolved considerably. The volume of data available today is growing at an unprecedented rate. The initial report founding CODATA refers to an increase in available data as "approximately doubling every eight years". In 2002 it has been estimated that the human species scientific project stored approximately five exabytes of new information on various supports (paper, film, optical or magnetic media), a number that doubled in the past three years. Five exabytes, as it happens, is equivalent to the number of all words ever spoken by humans since the dawn of time!

This evolution results from the new technological capability at the nano-scale, new large scale facilities, global observing programs, remote sensing satellite data, advanced modelling and simulation technology to name but a few. This in turn raises challenging questions on how do we manage, preserve this data? How do we address data quality, data pollution issues? What are the legal, economic and technological barriers to accessing this data? The list continues....

The 21st International CODATA Conference, Scientific Information for Society - from Today to the Future, touched on many of these challenges and questions in its plenary and parallel sessions. The theme the Conference emphasized was the information society and the role IT plays in cultivating and nurturing an open access environment to scientific data and information.

As you read through this Book of Proceedings you will see how the plenary sessions provided an opportunity to state and develop the overall theme of the conference, while the multiplicity of parallel sessions provided ample evidence for the diversity of activities embraced by CODATA and the challenges and questions that have arisen in the evolution of the organization in today's IT environment. Just a few examples of the sessions topics illustrate this: Information Society, global climate change, Grid infrastructure, geophysical data systems and analysis, biodiversity, scientific capacity building, repositories for scientific data, materials: data exchange, nanotechnology, natural disasters and risk, e-science collaboration, International Polar Year, biological and genetics data, etc.

Many young scientists participated in the event, thereby recognizing the importance of engaging the younger generation of scientists to lead future developments in a world community increasingly dependent upon information and scientific data.

The strong scientific content of the meeting was thanks to the hard work and dedication of an International Scientific Program Committee, led by Shuichi Iwata and Michael Zgurovzky. Logistically, the 21st International Conference was indeed a success attended by approximately 400 scientists from around the world. This is directly related to the outstanding support of a strong and committed Local Organization Committee culminating in this Book of Proceedings.

On behalf of CODATA International we thank you.

CODATA International Secretariat
Paris, December 2008

21st International CODATA Conference

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21st International CODATA Conference

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21st International CODATA Conference



КАБІНЕТ МІНІСТРІВ УКРАЇНИ
ВІТАЛЬНИЙ АДРЕС

*Учасникам та організаторам 21-ї Міжнародної конференції
Комітету з даних для науки і технологій (CODATA)
З нагоди відкриття конференції*

Шановні друзі!

Стрімкий розвиток високих технологій потребує надійності та достовірності бази даних в усіх пріоритетних галузях науки та техніки.

Забезпечення доступу вітчизняних вчених та інженерів до міжнародних баз даних розширює можливість для прямої співпраці та здобуття нових знань.

Приємно зазначити, що Україна є першою постсоціалістичною країною Європи, де проводиться Міжнародна конференція Комітету з даних для науки і технологій.

Проведення в Україні Конференції є важливим кроком до інтеграції нашої країни у світовий науково-інформаційний простір, що надасть імпульс для подальшої розбудови інформаційного суспільства в Україні.

Упевнена, що українські вчені і надалі займатимуть передові позиції у розробці найсучасніших високих технологій.

Від усього серця хочу побажати всім Вам міцного здоров'я, нових творчих звершень, здійснення всіх Ваших планів і задумів для розбудови нашої держави.

Прем'єр-міністр України

Юлія ТИМОШЕНКО



CABINET OF MINISTERS OF UKRAINE
WELCOMING ADDRESS

*For participants and organizers of 21st International Conference
of Committee on Data for Science and Technology (CODATA)*

Dear friends!

The rapid development of high technologies requires the reliability and validity of databases in all priority fields of science and technology.

Providing young Ukrainian scientists and engineers with the access to the international databases gives more possibilities for direct cooperation and acquiring new knowledge.

It is very pleasant to mention that Ukraine is the first post socialist country of Europe where the International CODATA (Committee on Data for Science and Technology) conference takes place.

Conducting this Conference in Ukraine is a very important step towards the integration of our country into the world research information area giving an impulse for the future development of the information society in Ukraine.

I am confident that Ukrainian scientists will take leading positions in the development of high technologies.

I would like to wish all of you good health, great creative achievements, fulfillment of all your plans and intentions aimed at future progress of our country.

The Prime Minister of Ukraine

Yulia Tymoshenko



President of CODATA Dr. Krishan Lal opens the conference "CODATA-21"



The opening ceremony



Director of the Division of Secondary, Technical and Vocational Education – UNESCO, Iwamoto Wataru presenting a welcome message of Special Patron of the Conference Director-General of UNESCO Koïchiro Matsuura



Alexander Zinchenko – Special Representative of the Prime Minister of Ukraine – addresses participants during the opening ceremony



Greetings from Volodymyr Polokhalo – Chairmen of the Committee on Science and Education of Verkhovna Rada of Ukraine



The Keynote Speaker Bohdan Hawrylyshyn (left) with Former President of CODATA Shuichi Iwata (right)



President of CODATA Krishan Lal (right) with Special Patron of the Conference, President of the National Academy of Sciences of Ukraine Borys Paton (left)



Rector of the National Technical University of Ukraine "Kyiv Polytechnic Institute" Michael Zgurovsky; Former President of CODATA Shuichi Iwata; President of CODATA Krishan Lal



CODATA "Kyiv School" for young scientists and students "Data Science and Design Science on Materials", 3-4 October, 2008



CODATA RMA Symposium 2008 "International Symposium on Risk Models and Applications", 5 October, 2008



Professor Liu Chuang giving the 2008 CODATA Prize Lecture



On behalf of Local Organizing Committee...



More than 150 students of the National Technical University of Ukraine "Kyiv Polytechnic Institute" – assisted the Conference as volunteers



Sessions



Parallel Session "WDC. Emerging Technologies and Opportunities for Global Data Management and Exchange"



Parallel Session "Roundtable Report on Activities on CODATA Task Group on Preservation of and Access to Scientific Data"



Poster Session



Closing Plenary Session



EVER YOUNG "KPI" ! A GLANCE INTO THE FUTURE



Conference Photo in Great Academic Council Hall



Goodbye Kyiv !
Welcome to Cape Town, South Africa !
Welcome to CODATA-22 !

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