



1993 – 2008  
15<sup>th</sup> Anniversary of the  
Croatian Academy of Engineering

# Engineering Power

BULLETIN OF THE CROATIAN ACADEMY OF ENGINEERING

Vol. 7(1) 2008



CAETS

Croatian Academy of Engineering received a memo from the Ministry of Science, Education and Sports of the Republic of Croatia dated April 7th, 2008 with regards to the organization of the 300th anniversary of the birth of Ruđer Bošković in 2011.

Extract of the memo:

“Apart from the preparations for international symposium celebrating the 200th anniversary of the foundation of the Illyrian Provinces, a project of the celebration of the 300th anniversary of the birth of Ruđer Bošković has also been announced.

We are free to entrust you with the organization of the celebration with the participation of Croatian and French scientists and historians in 2011 in respect to the experiences gained in the realization of the Nikola Tesla project.” (završetak citata).

At the meeting of the Presidency held on May 12th, 2008 Croatian Academy of Engineering accepted the proposal of the Ministry. Therefore, we would like to inform you below about the characteristics of the life and work of Ruđer Bošković.

## Ruđer Josip Bošković – Toward the 300<sup>th</sup> Anniversary of his Birth

So far numerous pages have been written about famous and world renowned Croatian scientist Ruđer Josip Bošković and his work. He has been a scientist with a wide scope of activities; philosopher, astronomer, mathematician, physicist, geodesist, constructor of instruments, hydro technician, expert in statics, archeologist and moreover a writer and diplomat. In preparations to commemorate the 300th anniversary of his birth, let us briefly remember his life and work with special emphasis to his contribution to engineering.

He was born in Dubrovnik on May 18th, 1711 and died in Milan on February 13th, 1787. In Dubrovnik he attended Collegium Ragusinum up to 1725 when he joined the Jesuits in the novitiate of St. Andrew on Quirinal in Rome. He finished the novitiate with *ad studia* rating in 1727. At the main college of his order, Collegium Romanum, he attended rhetoric from 1727 to 1729, as well as triennial studies of philosophy from 1729-1732 and theology from 1738-1741. In the period between the studies of philosophy and theology he lectured, as master of *grammaticae et humanitatis*, in colleges of Rome and Fermo. In 1740 as the third year student of theology he started lecturing *mathematics* at the Collegium Romanum study of philosophy. He took his clerical vows and the oath of obedience to the pope in 1744. During his life he changed four posts: public professor of *mathematics* at the Collegium Romanum study of philosophy from 1740 up to 1760, together with absence from Rome due to research and diplomatic reasons; professor of *mathematics* on the revived University in Pavia from 1764 to 1789 under Austrian authority; professor of *applied mathematics with optics and astronomy* at the court colleges in Milan from 1770 to 1773; head-master of optics with the French Navy from 1774 up to 1782.

He undertook four voyages: a visit to Dubrovnik in 1747, geodetic and cartographic expedition from Rome to Rimini from 1750-1752, travels to Lucca and Vienna from 1756-1758 due to hydro technical dispute between Lucca and Tuscany and a study travel to European capitals from 1759 to 1763 when he visited

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Newton's Cambridge. Even after the pope's suppression of the Jesuit order in 1773 he remained priest and accepted his friend's invitation to continue his scientific works in Paris. In 1747 he accepted French citizenship so he could become high official in the French Navy. Having obtained a leave, he left Paris in 1782 and spent three years in Bassano in supervision of

the preparations for printing of his 5 volume works *Opera pertinentia ad opticam et astronomiam*.

Among all Croatian scientists Bošković has excelled by his unsurpassed work which has not only promoted the science, but also changed the scientific picture of the world. In natural philosophy, astronomy and optics Bošković has been very influential. In series of documents, from his dissertation *De viribus vivis* (1745) to the synthesis in his master piece *Philosophiae naturalis theoria* (1758), he established original theory of forces.

In the period between 1751 and 1782 he published a number of hydro technical expertise for rivers, water works, fountains and marshes. Among static expertise the most important ones are about fissures on the dome of St. Peter's Basilica in Rome (1742-1743), damages of the building of the Imperial Library in Vienna (1763) and the stability of the spire on the dome of Milan Cathedral (1764).

Between 1750 and 1785, in the time of manual manufacturing of instruments, he achieved remarkable success in construction and verification of optical, astronomic and geodetic instruments. He invented circular micrometer, dealt with lens flaws and their elimination, as well as improvements of optical devices. For determination of the fraction and dispersion of light he constructed a device named vitrometer. He offered a kind of binoculars filled with water. He made optical prisms with adjustable angle (Bošković prism).

Rather early he was occupied with the problems of the form and size of the Earth (*About the Evidence of the Ancient for the Spherical Form of the Earth – De veterum argumentis pro telluris sphaericitate*, 1739; *Dissertation on the Form of the Earth – Dissertatio de telluris figura*, 1739) and with the problems concerning Newton's gravitation theory (*About Inequality of Gravity on Different Locations of the Earth – De inaequalitate gravitatis in diversis terrae locis*, 1741). In order to solve these problems he had to, along with theoretical research, make measurements of meridian degrees at different locations of the Earth.

First incentive for geodetic measurements Bošković owed to the invitation of Portuguese king Joao V in 1750. With the permission of the Jesuit general he applied for the departure to Brazil so he could take part in the demarcation of Spanish and Portuguese kingdoms provided that he would be allowed to measure one meridian degree. His intention was altered by cardinal Valenti, state secretary of the Holy See, who procured the appointment of pope Benedict XIV and Bošković had to set for "an astronomical and geographic journey" along the Rome-Rimini meridian in the Papal States. For his companion Bošković chose Christofer Maire and spent two academic years (1750-1752) on the journey. In 1755 the results were published in the scientific report *De litteraria ex-*

*peditione per Pontificiam ditionem* (About Scientific Research through the Papal States) in addition to which the first map of the Papal States, *Nuova carta geografica dello Stato Ecclesiastico*, was issued on a separate folio, made by C. Maire according to joint data. Therefore, Bošković can be considered as one of the precursors of Croatian cartography. In 1964/5 Borčić wrote in detail about terrain works which preceded the making of the map and its important elements such as adopted dimensions of the Earth's ellipsoid, map scale, cartographic projection, dimension of the folio, the purpose and content of the map, as well as its reproduction method. Bošković published main results of his geodetic measurements three more times: in 1757 in the abstract for the journal of the Academy of Bologna, in 1760 in the supplement of the Benedict Stay's poem and in 1770 in French translation of his major geodetic work *Voyage astronomique et géographique, dans l'Etat de l'Eglise*.

Furthermore, Bošković announced the existence of tidal waves of solid Earth crust. He was the first to define irregular form of the Earth, later named the geoid (J. B. Listing, 1873). He suspected that meridians were ellipses and confirmed it by his measurements. He claimed that the form of the Earth is not only curved, but also adjustable in time, what was established only many years later.

Bošković set up the theory of izostasy (1742, 1755, 1785), although the name of the theory derived from American geologist C. E. Dutton (1889). According to the theory the accumulation of masses and existence of gaps in the Earth's crust have been compensated by corresponding distribution of masses in the interior of the Earth. Discovery of the Mohorovičić discontinuity between the Earth's crust and the Earth's mantle in 1910 was in accordance with the Bošković's ideas of izostasy.

Bošković was the first in the history of science who established the method of measurement results adjustment having set up two conditions which later on P. S. Laplace rendered in a mathematical form so that it was named after him as Laplace's method (more recently Bošković-Laplace's method).



During his life Bošković received numerous recognitions. For instance, he was full member of *Scientiarum et Artium Institutum atque Academia* in Bologna (1746), associate member of *Académie des Sciences* in Paris (1748), honorary member of the *Imperial Academy of Sciences* in St. Petersburg (1760) and full member of the *Royal Society* in London (1761). On September 16th, 1757 the Senate of the Republic of Lucca pronounced him esquire due to his merits in the settlement of hydro technical disputes with Tuscany. In the Roman circle of Croatian Latinists he was poetic inspiration: Benedict Stay in the tenth volume of his poem *Recentioris philosophiae...* dedicated 1,600 hexameters to the natural philosophy of Bošković and Rajmund Kunić wrote an elegy and several epigrams in Bošković's honour. A crater on the Moon has been named in his honour, and in Croatia respectable scientific *Kalendar Bošković* and *Almanah Bošković* have been named after him, as well as the most prominent *Ruđer Bošković Institute* and renewed award in natural sciences *Nagrada Ruđer Bošković*.

## 23<sup>rd</sup> Annual Assembly of the Croatian Academy of Engineering

March 14, 2008

23<sup>rd</sup> Annual Assembly of the Croatian Academy of Engineering was held on Friday, March 14<sup>th</sup>, 2008 with the following

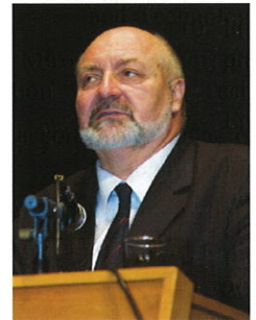
Agenda:

1. Opening of the Assembly and Report of the President about the work of the HATZ in 2007
2. Adoption of the 22<sup>nd</sup> Assembly Protocol
3. Draft of the Law on Croatian Chamber of Engineers and Technologists
4. Edition of the Lexicographic Institute 'Miroslav Krleža' – Technical Lexicon and its promotion
5. Performance of guitarist Mate Matišić and accordionist Marjan Krajna
6. Ceremony of the presentation of the HATZ Awards:
  - a) Award to the Young Scientist 'Vera Johanides'
  - b) Annual Award 'Rikard Podhorsky'
  - c) Life Achievement Award 'The Power of Knowledge'
7. Election of new supporting members of the HATZ and allocation of acknowledgements
8. Election of the members emeriti of the HATZ
9. Promotion of the Annual 2007 of the Croatian Academy of Engineering



*Ceremony of the presentation of the HATZ Awards*

10. Promotion of the Colloquium proceedings 'Ethics in Application and Development of Engineering Sciences'
11. Election of the HATZ Election Committee about to elect new Governing Board for the period from July 1<sup>st</sup>, 2009 up to June 30<sup>th</sup>, 2013
12. Financial statement from 2007 Balance Sheet and its acceptance
13. Agenda and financial plan of the HATZ for 2008
14. Closing of the Assembly.



*Speech of the Prof. Slobodan Uzelac, Ph.D. Vice Prime Minister for Regional Development, Reconstruction and Return*

## Draft of the Law on Croatian Chamber of Engineers and Technology

more on "www.hatz.hr"

### Description:

By the proposed Law, that corresponds to existing legislative approach in other areas of economic activities, Croatian Chamber of Technologists and Engineers would be established in the fields of: agronomy, biochemical engineering, biotechnology, shipbuilding, electrical engineering, geological engineering, geotechnical engineering, graphic technology, information and communications technologies, chemical engineering, mining, petroleum engineering, food processing technology, computing, mechanical engineering, textile technology, protection and preservation of environment and similar areas. The Chamber would associate engineers and technologists who meet formal conditions (university graduate study), stipulated service (work) in profession, professional exam (when stipulated) and who perform or intend to perform most complex professional duties of their profession specified by the Law. By their membership in the Chamber they would acquire the status of "licensed engineers" who can perform most complex duties and tasks in the area in which they have been educated and in which they have been working: project making; drafting of professional documentation, drawing up of studies, elaborations, plans, pro-

grams and expertise; revision of projects, professional documentation, studies, elaborations, plans, programs and expertise; conduct and performing of works: construction and reconstruction of buildings, facilities and management systems; professional training; technical expertise; quality testing of: products, equipment, processes. As opposed to other laws, the proposed Law does not stipulate obligatory membership to the Chamber. The members of the Chamber (engineers who meet conditions) are free to decide whether they wish, by their membership in the Chamber, to acquire the status of licensed engineers and get the license for their respective professional work.

The Law will also regulate other issues of importance to the work of the Chamber, as well as the way of how to convene and constitute the first session of the Assembly. Constitutional Assembly of the Chamber will be constituted by votes of all engineers signed in the Register of Licensed Engineers who will, in their professional grades according to the areas of their activities, elect their representatives to the Assembly in the way to ensure the representation of the members of all professional grades in the Assembly of the Chamber.

## Nagrade Akademije tehničkih znanosti Hrvatske (HAZ) za 2007. godinu

### Nagrada za životno djelo: 'Moć znanja'

prof. dr.sc. **Branka Zovko-Cihlar**

(redovni član HAZ)



Prof. dr.sc. Branka Zovko-Cihlar uživa ugled uzornog stručnjaka u teoriji i praktičnom radu na području radiokomunikacija, posebice u segmentu televizijske, multimedijjskih komunikacija i šuma u elektroničkom svjetločemu radovi i udžbenici koje je objavila iz navedenih područja.

Od 1960. godine radi u nastavi te kako su se razvijale nove teorije i metode mjerenja u elektrotehničkim i razvojnim područjima. Sudjelovala je u razvoju proizvodnje elektroničkih komponenata i proizvođača televizora Radiolindustrije Zagreb, te je bila pokretač i glavni organizator proizvodnje komunikacijskih uređaja u tvornici UNIS – Telekomunikacije, Mostar, na temelju licencnog ugovora sa švedskom firmom LM Ericsson.

Prof. dr.sc. Branka Zovko-Cihlar bila je predsjednica Vijeća za radio i televiziju, imenovana od Sabora Republike Hrvatske u srpnju 2000. godine.

Organizirala je i vodila gotovo 40 različitih skupova i simpozija na kojima je sudjelovalo više tisuća stručnjaka i znanstvenika iz Hrvatske i svijeta. Aktivan je član (predsjednik znanstvenih komiteta i recenzentskih odbora) međunarodnih stručnih i znanstvenih skupova (KOREMA, IEFE, ELMAR, MIPRO, IWSSIP, EURASIP).

Od 1993. godine član je Hrvatske akademije tehničkih znanosti – HAZ i sudjelovala je u osnivanju Akademije, od kada vodi i Odjel za komunikacijske sustave. Od 2004. godine popredsjednica je HAZ.

### Godišnja nagrada 'Rikard Podhorsky'

prof. dr.sc. **Tomislav Filetin**

(redovni član HAZ)



Prof. dr.sc. Tomislav Filetin 1973. godine je diplomirao na Fakultetu strojarstva i prodogradnje Sveučilišta u Zagrebu. Na istom fakultetu je i magistrirao (1979.) i doktorirao (1986.).

Objavio je kao autor, ili u koautorstvu, 128 znanstvenih i stručnih radova, obavio više od 70 ispitivanja i ekspertiza materijala za potrebe industrije, a u timu razvio 18 baza podataka o svojevrsima materijala i računalnih programskih sustava za izbor materijala i definiranje parametara procesa. Vodio je 7 znanstvenih projekata i dva tehnološka projekta i bio suradnik na 8 projekata Ministarstva znanosti, obrazovanja i športa Republike Hrvatske. U koautorstvu ima jedan priznat konsenzualni patent.

Dobio je nagradu HAZU (2001.) za najviše znanstveno dostignuće u RH za područje tehničkih znanosti i nagradu Sveučilišta u Zagrebu 'Fran Bošnjaković' (2003.).

Bio je potpredsjednik HAZ od 2000. do 2005. godine, a od 2004. je član suradnik HAZU.

prof. dr.sc. **Bernard Franković**

(redovni član HAZ)



Dr.sc. Bernard Franković, redoviti je profesor u trajnom zvanju Tehničkog fakulteta Sveučilišta u Rijeci iz kolegija *Nauka o toplini I, Nauka o toplini II i Termodinamika snijesa* na sveučilišnom studiju strojarstva i prodogradnje, *Osnove nauke o toplini i Energija i energetski procesi* na sveučilišnom studiju elektrotehnike te kolegija *Izabrana poglavja iz toplinskih znanosti, Termodinamika analiza procesa i Prijenos topline i tvrti* na poslijediplomskom znanstvenom studiju strojarstva, modul termoennergetika.

Znanstvena i stručna djelatnost objedinjena je u 100 znanstvenih radova, doktorskoj disertaciji i magistratskom radu, prigoda u knjigama i drugim publikacijama, te 115 značajnijih stručnih radova (objavljenih 16 radova, 20 sudija, te 25 radova na ispitivanjima i mjerenjima u laboratoriju i 65 značajnijih projekata, razradenih na razinama idejnog rješavanja, idejnog projekta, glavnog projekta i izvedbenog projekta) od kojih je većina izvedena.

dr.sc. **Ivan Petrović**, izv.prof. (član suradnik HAZ)



Dr.sc. Ivan Petrović, izv. prof. diplomirao je s izvrsnim uspjehom 1983. godine na Fakultetu elektrotehnike i računarstva u Zagrebu, na smjeru *Elektronstvo i automatizacija s računarskim radom Numerički prova-čun induktivna uzbuđena namota relikantnog motora* mentor (prof. dr.sc. Zijad Hazadar).

Autor je ili koautor 20 znanstvenih radova objavljenih u znanstvenim časopisima i 108 znanstvenih radova objavljenih u zbornicima međunarodnih znanstvenih skupova te 26 recenziranih elaborata / studija.

dr.sc. **Darko Ujević**, izv.prof. (član suradnik HAZ)



Dr.sc. Darko Ujević, izv.prof. istaknuti je znanstvenik i stručnjak na području tekstilne tehnologije. Svoja znanja i iskustva stekao je kroz dugogodišnji rad u tvornici "Pionirka", a kasnije "Trimot d.d. Imotski" na ručnom i odgovornom radnom mjestu tehničkog direktora, a zatim kao dopredsjednik poslovnog odbora za razvoj i tehničke poslove.

Posebno je značajan njegov rad na složenom tehnološkom istraživačko-razvojnom projektu (STRIP) Hrvatski antropometrijski sustav (HAS) radi kojeg je i predložen za nagradu. U izradi tog projekta bio je glavni istraživač i okupio je 30 suradnika sa više fakulteta i tri hrvatska sveučilišta s područja tekstilne tehnologije, medicine, pedijatrije, antropologije, statistike i matematike.

Imotski” as technical director and later on as vice-president of Managing Board for Development and Technical Affairs.

Particularly remarkable is his work on complex technological project of research and development (STRIP) Croatian Anthropometric System (HAS) due to which he has been nominated for this award. He has been the main researcher of the project who has gathered 30 collaborators from several faculties and three Croatian universities from the field of textile technology, medicine, pediatrics, anthropology, statistics and mathematics.

**Prof. Stanka Zrnčević, Ph.D.**  
(Associate Member of the HATZ)

Scientific activity of Prof. Stanka Zrnčević, Ph.D. is attached to catalytic reaction engineering. Particularly remarkable is her contribution to the application of chemical engineering methodology in the development of catalytic processes by which noxious substances from industrial waste gases and waters are removed. She has published over sixty scientific and professional works in local and foreign publications and taken part at numerous scientific conferences at home and abroad. She has also been the head and associate of many scientific projects, and the co-author of several preliminary designs made for industry. She is closely collaborating with several groups of scientist working at development institutes of our largest industries (INA, PLIVA) on the development and application of catalysts.

She has devoted all her pedagogic activities to the transfer of knowledge and education of young experts. Special emphasis should be put to her book “Catalysis and Catalysts” the structure of which presents her long-standing pedagogic and scientific work through clear and simple sentences, as well as competent explanations of both basic scientific knowledge and issues deriving from practice.



**Award to the Young Scientist ‘Vera Johanides’**

**Jurislav Babić, Ph.D.**

Jurislav Babić was born on March 14, 1978 in Gradačac, Bosnia and Herzegovina. After having finished primary school and secondary school of technology, in 1977 he entered the study of food technology with the Faculty of Food Technology of the J. J. Strossmayer University in Osijek where he graduated from in 2002 as the first of his generation.



He has published 15 scientific works out of which 4 in the journal indexed in tertiary publications (a1), 3 in secondary (a2) and 8 of his scientific works have been published in conference proceedings of international scientific conferences (a3). He has taken part in 12 international and 3 homeland scientific conferences.

**Mato Baotić, Ph.D.**

Mato Baotić was born on December 23, 1973 in Brčko, Bosnia and Herzegovina. In 1992 he finished secondary school specializing for mechanical technician in Orašje, Bosnia and Herzegovina. In 1997 he graduated from the Faculty of Electrical Engineering and Computing of the Zagreb University, division of *Automatics*, with emphasis on scientific research.



He has published 12 scientific works in international publications (out of which 7 works in prestigious CC publications and 3 works – published as chapters of a book – in SCI publications), as well as 18 works on international congresses. On October 28, 2007 according to the SCI database he was quoted 46 times (excluding his own quotations): 36 quotations of his works were published in CC/SCI publications and 10 quotations of his works were delivered at the conferences.

**Iva Rezić, Ph.D.**

Iva Rezić was born on December 15, 1973 in Zagreb where she finished Secondary Musical School “Pavao Markovac” and in 1992 XVI High School for Languages.

In 2007 she finished her postgraduate doctoral study *Engineering Chemistry* at the Faculty of Chemical Engineering and Technology with her thesis “Application of ICP-OES: determination of heavy metals in textile extracts after applying ultrasonic and microwave techniques” under the mentorship of Ilse Steffan, Ph.D. from the Institute for Analytic Chemistry, the Faculty of Chemistry of the Vienna University, Austria.



**Anita Tarbuk, M.Sc.**

Anita Tarbuk was born on July 19, 1975 in Bjelovar where she finished primary and secondary schools. In 2001 she graduated from the Faculty of Textile Technology of the Zagreb University with her thesis “Sorption Qualities of Medullar Wool” under the mentorship of Prof. M. Andrassy, Ph.D.

She has participated in 33 international scientific conferences with 43 scientific works out of which 31 have been fully published. 22 works have been presented orally. At 5 local scientific conferences 7 scientific works have been orally presented out of which one has been fully published. Published works are the result of research made within a two months' scholarship for young scientists Arge Alps-Adria, Büro für Internationale Beziehungen Karl-Franzens-Universität (KFU), Graz.



**Darko Vasić, M.Sc.**

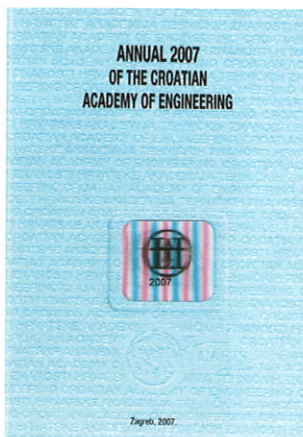
Darko Vasić was born on February 19, 1978 in Zenica, Bosnia and Herzegovina where he finished primary school. He finished secondary school in Zagreb. He was a member of the Croatian national team at the 28th International Olympic Games in Physics in Sudbury, Canada in 1997.

As the author and co-author of five works he has published the results of his research in CC/SCI publications, as well as 19 works at scientific conferences. 5 works of his have been quoted in the *ISI Web of Knowledge* database and 4 works he has been the author or co-author of in SCOPUS. He is standing reviewer of the publication *IEEE Transactions on Instrumentation and Measurement*. He is the member of following associations: Institute of Electrical and Electronic Engineers (IEEE), Croatian Society for Medical and Biological Technology, International Federation for Medical and Biological Engineering (IFMBE) and Society of Exploration Geophysicists (SEG).



## Annual 2007 of the Croatian Academy of Engineering

ISSN: 1332-3482



The Annual 2007 is divided in three units.

The first unit comprise significantly elaborated versions of the papers submitted at the conference "Engineering Education – the Bologna Process – 3 years later". Thus in the introduction we have the papers of Dragan Primorac, the Minister of Science, Education and Sports, Aleksa Bjeliš, the Rector of the Zagreb University,

4 papers of eminent scientists from abroad who have been monitoring the implementation of the Bologna Process into higher education in Europe for years, as well as two papers about the expectations of our economy from the Bologna Process. There follow 12 papers of deans or provosts of most prominent Croatian faculties in the field of technical sciences with their views on good and bad aspects, advantages and problems in the educational process modified according to the Bologna guidelines. In the addendum there are 9 PPT presentations of the authors who have not sent their papers on time, but the editorial board has considered their PPT presentations worth publi-

shing. The first unit gives a very interesting and competent review of the issues and impact the Bologna Process has made on the educational process in Croatia.

The project of changes in educational process according to the Bologna guidelines is one of the most important projects in the Republic of Croatia from its establishing. It is the question of education of our youth, namely the best we, as a small country, have. In their hands lies the future of our country. Therefore, it is worth emphasizing that the papers in the Annual are a small, but first serious contribution to the evaluation of present success, future problems and possible improvements in the application and changes of the educational process according to the Bologna guidelines in technical and biotechnical field. It is recommended to everyone involved in higher education in the field of technical sciences and other areas to read this part of the Annual 2007.

The second unit deals with international acknowledgements to the members of the HATZ and some details about our international cooperation. Special attention should be paid to the review of development strategy of CAETS and to the conclusions of CAETS about environment and sustainable growth.

The third unit presents the updated list of the members of the HATZ – "Who is Who".

## Ethic in the Application and Development of Engineering Sciences

ISBN: 978-953-7076-14-06



Colloquium proceedings "Ethics in Application and Development of Engineering Sciences" represent a selection of previously reviewed papers from the colloquium held on June 3, 2005 in the Hall of the Faculty of Food Technology and Biotechnology of the University of Zagreb. Foreword from the UNESCO web page gives the best description about the importance and significance of the colloquium

proceedings topic. As early as in 1998 UNESCO began the programme of "Ethics in Science and Technology", which was being extended these days to the boundaries of space technology and nanotechnology. Colloquium proce-

edings include nine papers in Croatian and in English from different fields of technical sciences, as well as philosophic reflections about the impact of applied technology and biotechnology on the economy.

Those issues are of special interest and even more attention should be paid to them in the years to come. By its geographical and economic definitions Croatia belongs to the surroundings in which transfer of technologies from more developed centers takes place, hence social structure of inhabitants and influence of multinational companies call for additional concern of the society as to new investments and unemployment issues. These colloquium proceedings in Croatian and English are going to inform the public both at home and abroad about the way the Croatian Academy of Engineering, besides its regular programmes of scientific research, development of new technologies and lifelong education, also takes care about ethics oriented to the welfare of humanity, being such an important global issue these days.

## Engineering Education – the Bologna Process – Three Years Later



The year 2007 will be remembered as the year in which we initiated and succeeded in returning the title of an engineer into our higher education system. Not for our sake, as we have our titles and nobody has deprived us of them, but for the sake of the future generations who are going to meet their colleagues all over the world. The task of our Academy is not and will never be to watch its own

narrow interest or the interest of its members, but to advocate knowledge, creativity and competence in order to prove that in proportion to the size of our country, we are not only equal, but even better than many European countries. If we take a look at huge programmes of the European Union which has a special platform dedicated to “Engineering Education”, if the United States of America announce their programme “Engineering Education until 2020”, then the efforts we made in the past were not useless. Without regaining the title of an engineer we could not start our international conference “Engineering Education – the Bologna Process – Three Years Later” which, under the high patronage of the President of the Republic of Croatia, Stjepan Mesić, and in attendance of experts from abroad together with our scientists and leading managers, established where we were, how we had prepared ourselves for the second part of the Bologna Process ahead of us and primarily, how we had prepared our students to understand the difference between the former and the new system of higher education. It should be mentioned that engineering education for the production of the 21st century is essentially different from the one we have today, since rapid development of technology will lead to unthinkable changes in the implementation of scientific

achievements. Our Academy, rather than the other parts of the society, should not only keep pace with, but be an active partner to thousands of scientists and experts throughout the world gathered around CAETS and EuroCASE.

All presentations, lectures and discussions are recorded with the help of CARNET and available on [www: hatz.hr/engineeringeducation](http://www.hatz.hr/engineeringeducation).



*Prof. Zlatko Kniewald, Ph.D.,  
President of HATZ*



*Prof. Melita Kovačević, Ph.D., Vice-rector for Science and Technology of the University of Zagreb*



*Members of “Platform for Engineering Education” EuroCASE  
from left to right: Prof. Reiner Koop, Ph.D. – Germany,  
Prof. Janos Gintzler, Ph.D. – Hungary,  
Prof. Kurt Richter, Ph.D. – Austria*



*Guests of the University of Zagreb  
from left to right: Prof. Vedran Mornar, Ph.D. – dean of FER  
Prof. Melita Kovačević, Ph.D. – Vice-rector for Science and Technology of the University of Zagreb  
Prof. Bojan Baletić, Ph.D. – Vice-rector for Financing of the University of Zagreb  
Prof. Tonko Ćurko, Ph.D. – Vice-rector for Development and Spatial Planning of the University of Zagreb*



## Signing the Agreement between Belupo Inc. with HATZ



## AKADEMIJA TEHNIČKIH Znanosti HRVATSKE

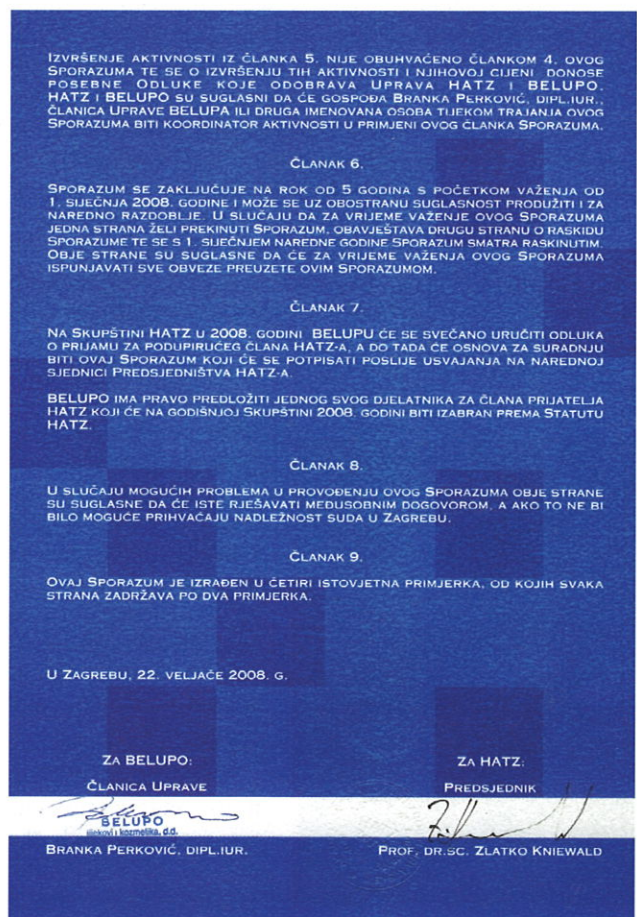
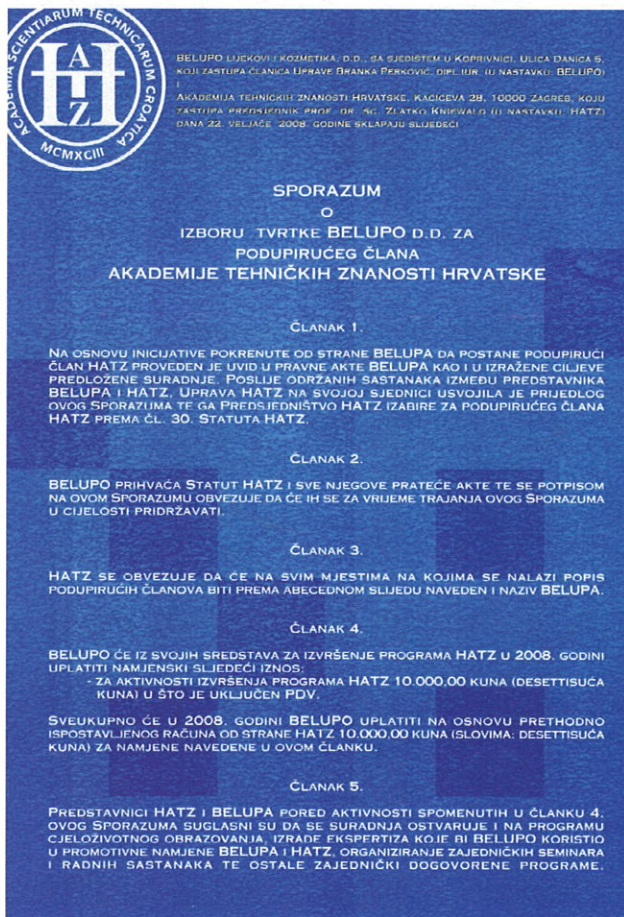


### SPORAZUM O SURADNJI

ZAGREB, 22. VELJAČE 2008.

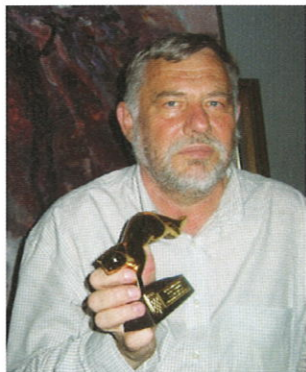


Agreement signed Member of Board Belupo Inc. Branka Perković and President of HATZ Prof. Zlatko Kniewald, Ph.D.





## Life award Zlatna kuna: Prof. Vilko Žiljak, Ph.D.



Prof. Vilko Žiljak, Ph.D.

of Commerce and this year to professor Žiljak “for exceptional contribution to the graphic industry development”.

Vilko Žiljak has a very fruitful cooperation in the field of business and with government institutions on which he has based his research and development achievements. He has introduced new digitalization methods into the graphic industry in all segments: prepress, press and post press.

Vilko Žiljak is a full professor with permanent title in the field of graphic technology. He is a regular member of the Croatian Academy of Engineering. In 2008 he was awarded the life achievement award Zlatna kuna (Gold Marten). The award was handed over by Luka Bebić, President of the Croatian Parliament. The award is given by the Croatian Chamber

Software has been introduced in printing plants for production managing and planning he has developed with his closest collaborators. Significant projects are the following ones: digitalization of the state topographic maps, documents and securities graphics, design of Croatian original money – the Kuna.

He was born in Sveti Ivan Zelina in 1946. He got his doctor's degree in 1981 with the Faculty of Electrical Engineering in Zagreb and acquired the title “doctor of technical sciences in the field of computer sciences”. Vilko Žiljak is Head of the Department for Typography and Computer Technique with the Faculty of Graphic Arts. With six postgraduate and many pre-graduate studies he has introduced subjects linked with modeling and simulation, graphics technology, informatics and visual research with the help of computers. Twenty two scientists have received their master's or doctor's degrees with various colleges under his mentorship. In his biography ([www.ziljak.hr](http://www.ziljak.hr)) there is a list of more than 400 titles: books, scientific and expert works, cooperation in the field of economics, educational films and projects with MZOS.

## Center for Graphical Engineering of the Croatian Academy of Engineering (CGI)

### Conference “Printing 08”



The Conference entitled *Printing 08* held from January 31 to February 2, 2008 at Stubičke Toplice, was organized by the Center for Graphical Engineering of the Croatian Academy of Engineering. The event was under the patronage of our two biggest publishing and graphic organizations, as well as The School of Graphics Arts, Polytechnics of Rijeka and Zagreb, The Osijek Graphic Engineers Society.

Scientists from Austria, Slovenia, Greece and Croatia presented their papers at the conference. Among those in the audience there were professors from Bosnia and Herzegovina, Germany and Spain. Many graphics engineers were interested in the opinion of experts on the situation and development of the printing business technology, innovations, and production automation. The organizing committee consisted of 22 top experts and the scientific committee consisted of 38 professors from Croatia and abroad. Papers were read on the achievements

of the scientific program “Digital Systems in the Printing Business” and its projects with the Ministry of Science, Education and Sports of the Republic of Croatia. A special section presented the results of research work based on the master's and doctoral theses from the previous year.

The papers have been printed in a book (ISBN 978-953-7064-08-2, CIP 657497 NSK) under the same title and can be found at the following web address: <http://www.ziljak.hr/tiskarstvo/tiskarstvo08/>. Lectures given by Suarez Prada, Ph.D., Werner Sobotka, Ph.D., Mario Plenkovic, Ph.D. and Klaudio Pap, Ph.D. have initiated many issues during the Conference and afterwards as well during the supper that has lasted well until morning hours of the following day. The leading persons from Vjesnik, Zrinjski Printing Works, Slobodna Dalmacija, Istragrafika, Narodne novine, Grin (Gracanica, Bosnia and Herzegovina) made an effort to bring into coordination their viewpoints on investing and modernizing their plants together with the experts present there. The day following the Conference turned into a working day as well: there were many questions, negotiations, planning of expert visits. New topics have been opened that are going to determine the Conference issues next year. We are expecting guests from other countries that have already announced their arrival and participation, especially in working groups with set goals.

## Center for Environmental Protection and Development of Sustainable Technologies (CEZOR)

### Conference “Water Treatment Technologies”

Zadar, October 21–24, 2007



From October 21<sup>st</sup>–24<sup>th</sup>, 2007 scientific and professional conference Water Treatment Technologies was held in Zadar, under organization of the Center for Environmental Protection and Development of Sustainable Technologies of the Croatian Academy of Engineering.

Conference was attended by 80 participants out of 100 registered ones. Bad weather was the

cause why a part of potential participants was absent.

Mrs. Ružica Drmić, Secretary in the Ministry of Agriculture, Forestry and Water Management was present at the opening ceremony.

Scientists, professionals and other university staff, people from business and other fields connected with water management gathered on the conference.

The conference was organized through invited lectures of prominent scientists and oral presentations. Presentations were mostly dealing with problems and solutions in water treatment technologies. Invited lecturers were Prof. Her-

mann H. Hahn, Ph.D. from the Faculty of Civil Engineering of the Karlsruhe University, Germany and Prof. Ivan Mijatović from the Faculty of Food Technology and Biotechnology of the Zagreb University. Presentations of respectable invited scientists and other scientists and professionals from Croatia were very well attended. The conference topics, quality and organization were highly marked by participants, lecturers and guests.

Two announcements were published (first and second), as well as proceedings with 21 published papers and a CD. Special website was prepared which enabled direct registration of participants. Several manufacturers and utility firms from the field of environmental protection were presented.

Visits to the water abstraction on the river Zrmanja, a part of Zadar water supply facility, the factory of bottled spring water CEDAR in Krupa and wastewater treatment plant Zadar were organized.

The conference was covered by media on local radio stations.

Such gatherings are greatly contributing to the promotion of scientific achievements thus enabling dialogue between scientists and professionals. Therefore, it is the wish of the organizer to continue with the organization of such events in our country.

## Biotechnical Center of the Croatian Academy of Engineering



In collaboration with the Center for Lifelong Education of the HATZ, from February 11-22, 2008 the Biotechnical Center organized and held a workshop for the employees of Belupo d.d. entitled “Biotechnology and its Application in Pharmaceutical Industry” (BPF 08). Before its start the workshop attendees (seven employees of Belupo d.d.) received the abstracts of lectures,

exercises and seminars which helped them prepare their final exams. At the end of the workshop, workshop leader, Prof. Zlatko Kniewald, Ph.D., and Research and Development manager at Belupo d.d., Tatjana Šešok, M.Pharm., have evaluated the results of exams and assessed that all attendees have successfully finished the workshop and received relevant acknowledgements.

Attendees expressed their opinion about the workshop in their monthly “Glasilo BELUPO” No. 114, pages 15-16, of February 2008.

It has been only one in row of examples of the HATZ activities related to the programme of lifelong education for which there is an outstanding interest of our economy.



*All attendees have successfully finished the Workshop*



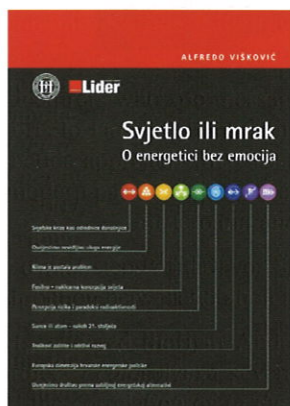
*Workshop Certificate*

## Center for Development Studies and Projects (CEDEP)

### Light or Darkness – about Energy beyond Emotions

ISBN 978-953-95472-2-4

Information about the Expert Meeting held on January 18, 2008 at the “House of the HATZ”



Center for Development Studies and Projects – CEDEP of the Croatian Academy of Engineering launched the project *Light or Darkness – about Energy beyond Emotions* in 2007 with aspiration to contribute to the realization of Croatian scientific and technological policies. Namely, in the document promoting the policies scientists are invited to become actively involved and contribute to its realization, as well as manufacturing companies to reconsider their activities and development projects and adapt them to the scientific and technological policies.

The project has started by the publication of the book by Alfredo Višković, Ph.D. *Light or Darkness – about Energy beyond Emotions* which has, owing to the collaboration with business weekly *Lider*, been printed in 10,000 copies. We have also marked the event by **The First Expert Meeting: Croatian Energy Platforms and the EU**.

According to the model of European Technology Platforms reflections upon Croatian energy platforms have been solicited in discussions about how to take advantage of the synergy of the HATZ in order to prudently connect, within its framework, fragmented Croatian production, professional and scientific potentials and meet the conditions for a modern working partnership with the EU.

The meeting was opened by the head of the CEDEP – HATZ project, Prof. Juraj Božičević, Ph.D., HATZ, and Assist. Prof. Alfredo Višković, Ph.D., HEP. Thereafter Prof. Željko Tomšić, Ph.D., Assistant Minister of Economy for Energy and Mining talked about new Croatian energy policy and invited the participants to contribute to its realization.

The attendants were then greeted by the president of the HATZ, Prof. Zlatko Kniewald, Ph.D., who pointed out that the issue of energy would be one of the special priorities in the programme of the next decade.

After the introduction the first speaker was Assist. Prof. Alfredo Višković, Ph.D., who emphasized that consideration about Croatian energy projects and their participation in European Energy Platforms were integral part of the HEP Group objectives the intention of which was to contribute to the realization of the Lisbon Strategy in Croatia as well.

Prof. Juraj Božičević, Ph.D., HATZ, presented latest objectives of European Energy Policy and the concept of European Technology Platforms as particularly important support to the promotion of the Lisbon Strategy. He pointed out to the bene-

fits of the transfer and implementation of European experiences in Croatia that should be done as soon as possible.

Those messages were also rendered by lecturers who spoke about their own experiences and efforts to launch projects in Croatia which would enable better approach to European Technology Platforms and a modern partnership of Croatia and the EU.

Prof. Davor Škrlec, Ph.D., FER, presented first steps of the collaboration in the field of intelligent distribution networks.

Marijan Andrašec, Ph.D., ECOOLEUM, rendered the results of several years of work on the project *Ecology and Energy in the Raša Valley* and presented the correlation of that complex project with European Technology Platforms.

Prof. Bruno Saftić, Ph.D., RGN, described his efforts to establish collaboration with European Technology Platforms through the research and development of demonstration projects for the implementation of seizing and geological storing of CO<sub>2</sub> emitted by thermal power plants. Those initial steps and project development are particularly important contributions to the preparations for fulfilling obligations Croatia has taken over by the ratification of the Kyoto Protocol.

Closing discussion emphasized the usefulness of the meeting and initiatives for urgent setup of work groups for Croatian mirror platforms for wind energy, intelligent distribution networks, CO<sub>2</sub> storage and for bio fuels.

Prof. Vladimir Koroman, Ph.D., head of Brodarski institut, has expressed the readiness of the Institute to join projects and to define further activities on the soon to be held second expert meeting.

Prof. Stjepan Car, Ph.D., President of the Board of Elektrotehnički institut Končar, pointed out to the importance that wider professional public and media should be acquainted with the messages of the project and especially with the promotion of a positive climate for industrial development and consolidation. Furthermore, he has stressed that domestic electrical industry (joint-stock companies with production and services in Croatia) is successful exporting over 50% and importing a little, and that, through taxes, it subsidizes the others (agriculture, shipbuilding, textile industry...). Moreover, energy sector has become a lever for dealing with social issues and thus less potent for investments. Hence in the energy sector lays a huge potential for economic development! Mr. Božo Milković, manager of TIBO-3. MAJ, Rijeka has supported him in this matter and pointed out to the production capabilities of his firm.

Nikola Bruketa, engineer from Ekonerg emphasized the importance and usefulness of the meeting and suggested recent resumption of the discussion and specification of the project.

Prof. Danilo Feretić, Ph.D., FER, has advocated for a more profound and complex reconsideration of Croatian energy policy, since reflections about renewable sources without consideration of the whole are but partially useful and effective.

Tonći Panza, engineer in Adria Wind Power, has informed the attendants that the firm Adria Wind Power d.o.o. has been involved in the SEEWIND project (research and demonstration project) set up to explore specific winds dominant in the coastal and mountain parts of the South-East Europe, as well as the influence of orography to the accuracy of wind potential measurements for existing models (such as WAASP etc.). It is an example of the possible participation in research and new technologies within the EU projects which should be announced in order to encourage our institutions and firms to take part, and to respectively propose interesting projects to be financed and applied. Total granted funds for the project amount to 3.6 million Euros.

Marijan Andrašec, Ph.D., ECOOLEUM, has summarized in the end possible messages of the meeting. Conclusions are as follows:

1. The project *Light or Darkness – about Energy beyond Emotions* is an important support in reflection and understanding of modern EU energy policy and basic contribution to the communication and partnership with the EU.
2. At the next expert meeting, according to the analogy with European Technology Platforms, it is necessary to propose Croatian mirror platforms and compatible projects.
3. It is necessary to invite economists and financial experts to the meeting in order to be joined to work groups.
4. The public and media have to be informed about the project and the expert meeting and the information about the meeting put on the web pages of the HATZ ([www.hatz.hr](http://www.hatz.hr)).
5. It is necessary to inform the Government of the Republic of Croatia, responsible ministries, scientific institutions and universities, as well as industry about the project.

## Report from the 17<sup>th</sup> CAETS Meeting Held in Tokyo, Japan

from October 23-26, 2007

17th meeting of CAETS (International Council of Academies of Engineering and Technical Sciences) was held in Tokyo from October 23-26, 2007 together with the simultaneous symposium "Environment and Sustainable Growth" to which Prof. Zlatko Kniewald, Ph.D., president of the HATZ, was invited as commentator and presented the paper "Participation of Croatia as a West Balkan Co-



*Croatian delegation on the CAETS meeting*

untry in European Scenarios about Energy and Greenhouse Gas Emissions", the authors of which were Zlatko Kniewald, Goran Granić and Jasna Kniewald. Besides its president, delegation of the HATZ consisted of Prof. Jasna Kniewald, Ph.D., president of the Committee for International Cooperation and Prof. Ivica Veža, Ph.D., secretary of the Department for Mechanical Engineering and Naval Architecture of the HATZ who was in Japan at the time.



*Speech of the Prof. Zlatko Kniewald, Ph.D., President of the HATZ*

Following conclusions were adopted at the annual CAETS Council Meeting held on October 26th, 2007:

1. Changes of CAETS Bylaws have been accepted so that the members of the Board of Directors have a two year mandate, the president of CAETS is elected each year and annual meetings of CAETS are to be held in the county of the president.



*Participation of Croatian delegate Prof. Jasna Kniewald, Ph.D. on the CAETS Board Meeting*

2. Schedule of the countries from which future presidents are coming has been presented according to which Croatia is set for the year 2021.
3. President of CAETS for 2008 is Gerard van Oortmerssen from the Netherlands, CAETS Council Meeting will be held on June 27, 2008 in Delft, and the members of CAETS are invited to register their members interested in the symposium "Delta Technology" to be held before the meeting from June 25-26, 2008 in Delft.
4. John Leggat from Canada has been nominated for CAETS president in 2009 so the 18th Convocation and Council Meeting is to be held in July 2009 in Calgary.
5. Within the report about the acceptance of new members in CAETS, it has also been suggested to CAETS members to support Academies of Engineering in neighbouring countries which have potentials to become new members of CAETS in the future.
6. Bulgarian Academy of Engineering (the representative of which has been present at the meeting) has shown inter-

rest in joining CAETS and New Zealand has shown interest in founding the Academy of Engineering. After the acceptance of the Croatian Academy of Engineering into CAETS membership in 2000, only German Academy of Engineering was also accepted.

8. Upon the recommendation of the HATZ delegation it was unanimously accepted that CAETS would be one of the sponsors of international scientific conference "Engineering Education – the Bologna Process – 3 Years Later" which was to be held in Zagreb from November 8-10, 2007 in the organization of the Croatian Academy of Engineering, the Ministry of Science, Education and Sports of the Republic of Croatia and the University of Zagreb.

9. "CAETS Statement on Environment and Sustainable Growth" which has been prepared in the form of main conclusions of the symposium "Environment and Sustainable Growth" has been accepted at the 17th Meeting. The document is available on the web pages of CAETS and HATZ. Considerable progress has been made in that area and special emphasis has been put to the contribution of all CAETS members in the future.

10. Australian Academy of Technological Sciences and Engineering has put forward the project "Accelerating the Technological Response to Climate Change" and invited all CAETS members to join it, while relevant information are to be sent by e-mail. HATZ has received the invitation and accepted its participation in the mentioned project.

11. Royal Swedish Academy of Engineering Sciences has announced the project "Strategies for Highly Efficient Conversion and Reuse of Matter and/or Energy", and invitations for participation are to be sent to all members of CAETS.

## Environment and Sustainable Growth

[www.hatz.hr/CAETS](http://www.hatz.hr/CAETS)

A Statement by CAETS, International Council of Academies of Engineering and Technological Sciences, Inc.  
Tokyo, Japan, October 23-26, 2007

At the 17th CAETS Convocation held in Tokyo on 23-26 October 2007, a wide range of global energy and environmental issues was reviewed and discussed by more than 230 CAETS academy representatives and specialists. The state-of-the-art of various technologies for improving energy efficiency, energy production with reduced carbon dioxide (CO<sub>2</sub>) emissions, carbon-free electricity generation; including nuclear power, and carbon dioxide capture and storage (CCS) was reviewed and discussed. The Convocation also considered water resources and pollution, control of noise pollution, recycling of materials and electronic devices, global environment monitoring systems and various strategies and measures for realizing sustainable growth. It recognized the need for urgent international and national development and implementation of counter measures for foreseeable local and global energy and environmental challenges.

The Convocation participants noted that much progress has been made in controlling air, water and other environmental pollution in developed countries, but that air pollution remains a serious problem, especially in rapidly developing countries, that millions of the planet's inhabitants still lack clean drinking water and sanitation and that environmental noise is a constraining factor for sustainable development.

The Convocation focused particularly on the impacts of increasing carbon dioxide concentrations in the atmosphere resulting from human activities as the world economy grows. Greenhouse gas emissions in the newly industrializing countries are increasing rapidly to rival those of the highly developed countries. As reported by the Intergovernmental Panel on Climate Change (IPCC), most of the observed global warming since the mid-20th century is very likely due to human-produced emission of green-

house gases and this warming will continue unabated if present anthropogenic emissions continue or, worse, expand without control.

The Convocation participants agreed that the adverse impact of global warming could be dramatic in the medium to long term future. The Japan Earth Simulator and other global earth system modeling centers are making many sobering predictions of the likely impacts as CO<sub>2</sub> concentration, global mean temperatures and sea levels continue to rise. CAETS, therefore, endorses the many recent calls to decrease and control greenhouse gas emissions to an acceptable level as quickly as possible. The Council recognized that it is the responsibility of the academies of engineering and technological sciences worldwide to alert their governments and citizens to the dangers posed by unbridled damage of the natural environment and future shortages or depletion of natural resources for fossil fuel; to work actively to apply existing solutions; and to foster new and improved technology as part of the global effort to avert dangerous human interference with the climate system.

In light of the Convocation deliberations and in order to realize sustainable growth and enhance the quality of life while reducing the use of fossil fuels for energy and curtailing greenhouse gas emissions, CAETS recommends that the following measures be urgently addressed through well planned implementation programs and research and development, including partnerships between governments and international organizations experienced with the relevant environmental issues.

1. Energy saving technologies must be greatly improved and disseminated as quickly as possible among both developed and emerging countries. Key initiatives considered most promising in the short term (in the next two decades or so) include the improvement of the efficiency of electric power generation and transmission and energy storage by batteries, effective use of heat pumps, advancement of the efficiency of internal combustion, electric and hybrid vehicles, improved energy-efficiency in commercial buildings and residences, and utilization of Light Emitting Diode (LED) technology for illumination.

2. The opportunities provided by information, communication and control technologies for reducing energy consumption, for example, by reducing the need for travel and through development of optimized logistics and smart power systems, should be exploited aggressively, along with efforts to reduce energy consumption in ICT devices and systems themselves.

3. Development of renewable and alternative energy sources must be promoted and their application should be encouraged. Breakthroughs in the technologies for hydro-electric, nuclear, solar, wind, biomass and geothermal energies, and high voltage DC power transmission in combination with high frequency power conversion should be explored for near to medium term exploitation; their appropriate use should be considered in light of the situation of each region. Development of innovative technologies for remote exploration and enhanced extraction of oil, gas and mineral resources from the oceans must be encouraged.

4. Studies must proceed to determine under what circumstances technologies for the capture and storage of carbon dioxide are feasible and cost effective. Other proposals to reduce emissions should be also encouraged and their effectiveness evaluated. Since, for some time to come, the use of fossil fuels will inevitably play a key role in economic growth to meet the needs of expanding populations for an acceptable quality of life, immediate attention to development of more effective (cleaner) and efficient use of coal and oil is essential.

5. The increased use of the nuclear power generation as an energy source must be addressed as a key issue for sustainable growth. CAETS recommends the promotion of studies on new generation reactors in the short and medium term and fusion research for the long term. Research to enhance safety measures, waste handling, economical performance and obstacles to non-proliferation are necessary for conventional reactors and associated fuel cycle facilities.

6. Other promising technologies warranting priority for medium to long term development, including hydrogen production, transport and storage and application of fuel cells for vehicles should be explored. The discovery and environmentally sound management of gas hydrates should also be promoted.

7. Together with advances of the new technologies referenced above and the more effective and efficient use of traditional energy sources, the modification of social infrastructures, consistent with the conditions of each economy, must also be seriously considered. For example, development of well organized public transportation systems should be investigated and implemented as appropriate to offer an alternative to the expansion of automobile fleets.

8. Nations should work together to ensure development and sustained operation of the Global Climate Observing System (GCOS) and the Global Earth Observation System of Systems (GEOSS) to provide the data and information needed to support global, national and regional strategies for sustainable development, including, for example, evaluating the total emissions of greenhouse gases and enabling more reliable projections of climate change.

9. Governments of all the countries should work towards a new post-Kyoto climate change framework, codifying the urgent and concerted actions needed to suppress the emission of greenhouse gases.

CAETS members are well prepared for presenting objective data to facilitate the debate on these issues by governments and national communities. By engaging their national leaders, CAETS academies will encourage increased investment in research and development on energy, and promote policies to encourage avoidance and mitigation of environmental pollution and global warming. Through their leadership in the technological sciences and engineering, the CAETS academies will continue to contribute to the goals of sustainable development worldwide. Engineers and technologists must work together for the benefit of humankind and promote wise utilization of the gifts of nature as represented by the Chinese character for engineering, '工'

## Department of Communication System of the HATZ

2007.

### 49<sup>th</sup> International Symposium ELMAR-2007

September 12-14, 2007, Zadar, Croatia

International Symposium ELMAR has 49 years of continuous tradition. ELMAR symposium is the oldest symposium in Croatia, and one of the oldest symposiums in this part of Europe. The fields of ELMAR symposia are image and video processing, navigation, radio communications, multimedia communications, speech and audio processing and other advanced research areas. ELMAR-2007 symposium took place under the technical co-sponsorship of IEEE Signal Processing Society, IEEE Region 8, IEEE Croatia Section, EURASIP, Croatian Academy of Engineering – HATZ, Ministry of Science, Education and Sports of the Republic of Croatia, University of Zagreb, Faculty of Electrical Engineering and Computing in Zagreb, and

University of Zadar. After the reviewing process International Programme and Review Committee has selected 57 submitted papers for the oral presentation. These research papers have been written by 138 authors. Participants have come from 19 countries. International Programme Committee has invited several outstanding experts as keynote speakers to present the state-of-the-art in different research fields: Professor *Ramjee Prasad*, Denmark; *Ismail Khalil Ibrahim*, Ph.D., Austria and *Elmar Noeth*, Ph.D., Germany. ELMAR-2007 organizing committee is specially obliged to thank Tankerska plovidba Zadar, as general sponsor from the beginning of ELMAR symposia.

2008.





### 50th International Symposium ELMAR-2008

September 10-13, 2008  
Zadar, Croatia

For further information please visit:  
[www.elmar-zadar.org](http://www.elmar-zadar.org)



*Poštovana/Poštovani,*

Prof. dr. sc. Zlatko Kniewald, predsjednik Akademije tehničkih znanosti Hrvatske i  
prof. dr. sc. Aleksa Bjeliš, rektor Sveučilišta u Zagrebu  
imaju čast pozvati Vas na predavanje pod nazivom


**"Computational Multiscale Analysis in Civil Engineering"**  
koje će održati

**prof. dr. sc. Herbert A. Mang**  
predsjednik Österreichische Akademie der Wissenschaften (2003. - 2006.)

u ponedjeljak, 23. lipnja 2008. u 13:30 sati u auli Sveučilišta u Zagrebu, Trg maršala Tita 14

Predavanje će biti na engleskom jeziku, bez simultanog prijevoda.  
Nakon predavanja održat će se rasprava i razgovor s uvažanim predavačem.

Molimo potvrdu Vašeg dolaska na e-adresu: [HATZ@hatz.hr](mailto:HATZ@hatz.hr), ili na tel: 01/49 22 559



**Herbert A. Mang**, born in 1942 in Vienna, Full Professor (Strength of Materials) and Head of the Institute for Mechanics of Materials and Structures at Vienna University of Technology (TUW). His main field of expertise is computational mechanics. He is coauthor and coeditor of 17 books, more than 400 articles in scientific journals and conference proceedings, coeditor of 2 international journals and member of the editorial board of 36 journals.

Academic functions: Dean of the faculty of Civil Engineering (1991-94), Prorector (Vice President) of TUW (1994-96), Secretary General of the Austrian Academy of Sciences (ÖAW) (1995-03), President of ÖAW (2003-06), Member of the Science Council of the Federal Government of Austria (since 2003), Activities in Scientific Organizations: Vice President of the International Association for Computational Mechanics, President of the European Community on Computational Methods in Applied Sciences, Acknowledgements: 5 honorary doctorates (Univ. of Innsbruck, Univ. of Mining in Leoben, Cracow Univ. of Technology, National Technical Univ. of Ukraine in Kiev, Czech Technical Univ. in Prague), Membership in 13 scientific and engineering academies, among them the U.S. National Academy of Engineering, many scientific prizes, medals and decorations.

## International Council of Academies of Engineering and Technological Sciences, Inc.

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### Council Meeting

0900 – 1700 Friday, June 27, 2008

Royal Institution of Engineers KIVI NIRIA, The Hague, Netherlands

#### Proposed Agenda

EXECUTIVE SESSION (Attendance limited to Member Academy Delegations)

#### OPEN SESSION

Welcome and Introductions of Member Academy Delegations and Guests

1. Opening and Approval of the agenda
2. Approval of the Summary Minutes of the Council Meeting of October 26, 2007  
[Summary Minutes of Board of Directors Meeting of October 22, 2007 of Executive Committee Meeting of April 23, 2008]
3. Report of the June 25, 2008 Meeting of the Board of Directors
  - a. Audit Committee Report on FY 2007
  - b. 2009 Budget
4. Administrative Actions (a – c) and Issues (d – f)
  - a. Election of Board Membership for 2009
  - b. 2010 Dues
  - c. Reports on CIO and CCM activities; committee membership
  - d. Distribution of CAETS Statement; “Environment and Sustainable Growth”

#### e. Future CAETS meetings:

- 2009 18th Convocation, CAE, Calgary, Canada; ExCom and Board Meetings, Monday, July 13; Convocation Tues. – Thurs., July 14-16; CAETS Council Meeting, Friday, July 17
    - 2010 Annual Meeting, ATV, Denmark
    - 2011 19th Convocation, AI, Mexico
    - 2012 Annual Meeting, SATW, Switzerland
  - 5. Roundtable Discussion – Engineering Education
  - 6. Discussion of ATSE proposal “Accelerating Technological Response to Climate Change”
  - 7. Report of the Workshop “The Global Noise Control Issue”
- LUNCH 12:00 – 14:00
8. Approval of CAETS Statement on “Delta Engineering: Enabling Life in River Deltas”
  9. Discussion on Engineering-Related International Activities: CAETS and Member Academy Interests and Opportunities
  10. Discussion of SATW Project “Highly Efficient Material and Energy Transition”
  11. Issues of Concern
  12. Activities of Interest
  13. New Business
  14. Presentation of Certificates
  15. Adjourn

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## Euro-CASE

The European Council of Applied Sciences, Technologies and Engineering

#### Euro-CASE's activities

[Euro-CASE Platform on Energy/Environment](#)

[Euro-CASE Platform on Engineering Education](#)

[Euro-CASE Platform on Innovation](#)

[Euro-CASE Platform on Mobility and Transport](#)

[Euro-CASE Platform on Information and Communication Technologies, ICT](#)

