



# NEWSLETTER

COMMISSION INTERNATIONALE D'OPTIQUE • INTERNATIONAL COMMISSION FOR OPTICS

## Zeev Zalevsky wins ICO Prize for 2008

**The 2008 ICO Prize winner has been exploring the limits of optical super resolution.**



Zeev Zalevsky, a professor and researcher at the Bar-Ilan University in Israel, is the winner of this year's ICO Prize for contributions to optics.

The ICO Prize, which was established in 1982 to be awarded annually to an individual who has made a noteworthy contribution to optics and published or submitted for publication before he or she has reached the age of 40, has been awarded this year to Zeev Zalevsky.

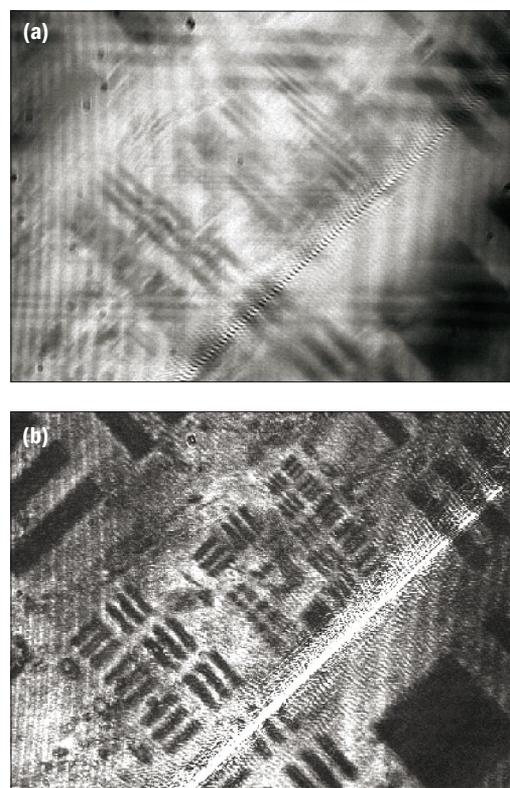
Zalevsky was recognized for "his achievements and significant contribution in the field of optical super resolution, in particular for his work in theoretical and experimental definition of various approaches for exceeding Abbe's classical limit of resolution."

Zalevsky was born in Russia in 1971 and received his BSc and PhD degrees in electrical engineering from Tel-Aviv University in Israel in 1993 and 1996, respectively. He is currently a professor of electro-optics in the school of engineering at Bar-Ilan University in Israel. His major fields of research are optical super resolution, nano-photonics and silicon photonics, in-fiber devices and microwave photonics.

In his work in the field of super resolution Zalevsky helped invent various ways to overcome diffraction and the geometrical limitations of detectors by performing adaptation and conversion of spatial degrees of freedom from the spatial domain into non-spatial domains (such as time, colours, code and polarization state), allowing the multiplexing of this spatial information and later on its extraction and reconstruction. He also worked on the axial extension of depth of focus and its relation to visual optics sciences.

In addition to his scientific activities, Zalevsky has helped found several start-up companies in various fields of electro-optics. Currently he is head of the electro-optics track in the school of engineering at Bar-Ilan University and leads a research group and laboratory with 15 PhD and masters students. Zalevsky coordinates several research grants in topics related to his fields of interest, which are funded by national agencies and high-tech companies. He is also the current head of the nano photonics group in the new nanotechnology centre being established at Bar-Ilan University.

In 2007 Zalevsky was awarded the Krill Prize for excellence in scientific research by the Wolf Foundation for his achievements in free-space optical systems and methods for enhanced



**Fig. 1.** Spatial information transmission using orthogonal mutual coherence coding: (a) the overall optical output of the system without applying super resolution; (b) the obtained result after applying the super-resolving algorithm for the one-dimensional case.

imaging and sensing, electro-optical in-fiber and waveguide-based devices for data sensing, processing and RF photonics.

Zalevsky has published two books, 12 book chapters, more than 170 refereed papers and he holds more than 10 issued patents. He has delivered many invited talks in various conferences in electro-optics and has taken part in organizing several international scientific events. It is expected that Zalevsky will be delivering the ICO Prize lecture in one of the forthcoming major ICO meetings (details will be published in a future issue of the *ICO Newsletter*).

Figure 1, above, is from Zalevsky's paper "Spatial information transmission using orthogonal mutual coherence coding." (Z Zalevsky, J Garcia, P Garcia-Martinez and C Ferreira 2005 *Opt. Lett.* 20

2837–2839.) The authors used the mutual coherence function of the illumination to code spatial information and exceed the diffraction limitations of an imaging system. In figure 1a they present the image as it is obtained without coherence coding, and in figure 1b they used coherence coding and obtained improvement of the spatial features that can be resolved in the US Air Force (USAF) resolution target. The demonstration of super resolution in this case was one-dimensional.

The ICO Prize committee for the term 1 October 2005 to 30 September 2008 con-

sisted of Yoon Kim as chair and A Friesem, J Love, G Jin and S Bagayev as members. For the term 1 October 2008 to 30 September 2011 the chair will be Min Gu (mgu@swin.edu.au) from the Centre for Micro-Photonics, Faculty of Engineering and Industrial Sciences, Swinburne University of Technology, John Street, PO Box 218, Hawthorn, Victoria 3122, Australia. Calls for the 2009 ICO Prize are now open. Nominations must be sent to Min Gu no later than 15 April 2009. For more information, see [www.ico-optics.org/awards.html](http://www.ico-optics.org/awards.html).

## Galileo Galilei medal is won by Widjaja

**The Galileo Galilei medal for 2008 recognizes the expansion of optics and photonics in Thailand.**



Joewono Widjaja, a professor at the Suranaree University of Technology in Thailand, is the recipient of the 2008 ICO Galileo Galilei award.

The ICO Galileo Galilei medal is awarded for outstanding contributions to the field of optics and photonics achieved under comparatively unfavourable circumstances. The unfavourable circumstances refer to difficult economic or social conditions, lack of access to scientific or technical facilities, or sources of information. The award contributes to one of the essential missions of ICO, namely to recognize the promotion of optics under difficult circumstances. The medal was established by the 1993 General Assembly and has been awarded annually since 1994.

For 2008 the medal has been awarded to Joewono Widjaja, professor at the Suranaree University of Technology in Thailand, “For his outstanding contributions in wavelet-transform-based signal processing, speckle metrology, holography, joint transform correlator, speckle and internet photonic routing. The committee considers the circumstances to be comparatively unfavourable as the candidate has performed all the activities in a developing country (as defined by the United Nations).”

Widjaja obtained a B. Eng. in electronics engineering from Satya Wacana Christian University in Salatiga, Indonesia, in 1986. He also gained an M. Eng. in electronics engineering in 1991 and a Dr. Eng. in electronics engineering in 1994, both from Hokkaido University in Sapporo, Japan.

In 1994–1995 he was a research associate at the University of Electro-Communication in Japan, where he performed research in wavelet-transform correlator and signal processing using photorefractive four-wave mixing. In 1995–1996 he was a postdoctoral research fellow at the School of Applied Science at Nanyang Technological University in Singapore, and continued his wavelet-transform work. Since 1997 he has been with the School of Laser Technology and Photonics, Institute of Science, Suranaree University of Technology, Thailand, where he became professor in 2007. Suranaree University of Technology is located in Nakhon Ratchasima Province, about 260 km northeast

of Bangkok, and is the first autonomous public university in Thailand.

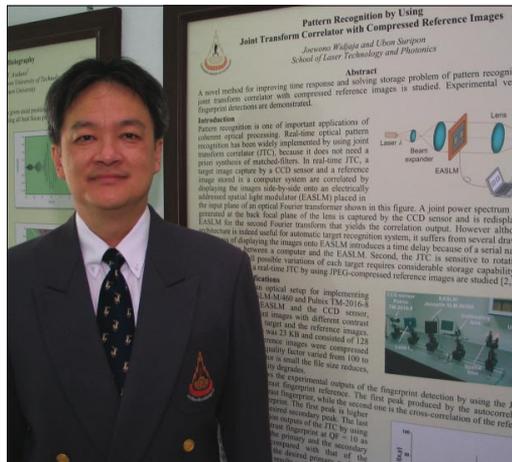
Widjaja’s research area covers wavelet-transform-based signal processing, holography and optical information processing, optical correlator and IP address processing for internet photonic routing. He has published 29 peer-reviewed papers and 16 proceedings of international conferences. He holds two patents related to method and system for multiplexed transmission, and method and apparatus for address processing in optical packet communication. His work on wavelet-transform correlators has been published in the *Encyclopedia of Optical Engineering* (Marcel Dekker, New York, 2003).

With regards to academic societies, Widjaja was an elected member of the Institute of Science committee in 2000–2001, and was on the editorial boards of the *Suranaree Journal of Science and Technology* and the *Optical Memory and Neural Networks* journal. He is the steering committee member of the Asian Committee for Experimental Mechanics, and was vice-president of the International Society for Optical Engineering (SPIE)’s Thailand chapter in 2004–2007. He has also been involved with organizing and promoting academic cooperation with overseas academic and research institutions.

Widjaja has received the following honours and awards: Asami Award (distinguished achievement in masters program) (1991), Hokkaido University Monbusho Japanese Government Scholarship (1987–1994), Japan Science and Technology Agency Fellowship, Japan Science and Technology Corporation, (December 1999–April 2000). He also delivered an invited talk at SPIE’s Photonics Asia in Beijing, China, in 2002, and a plenary talk at the International Conference on Optics and Laser Applications in Yogyakarta, Indonesia, in 2007.

As for the unfavourable conditions required for the nomination, Thailand is a developing country and its income depends mainly on agriculture and natural-resource extraction. After the economic crisis in 1997, Thailand is still

Joewono Widjaja in front of his poster "Pattern recognition by using joint transform correlator with compressed reference images" at a major optics and photonics meeting in Thailand.



in a phase of economic development. It lacks the development of modern infrastructures for research and education, and has a low budget for research, especially in more fundamental research in optics.

It is expected that Widjaja will deliver the Galileo Galilei award lecture at a major ICO

event (this will be announced in a future issue of the *ICO Newsletter*).

The chair of the Galileo Galilei award for the period 1 October 2005–30 September 2008 was Ichirou Yamaguchi from the Faculty of Engineering at Gunma University in Japan. Members of the committee were Sergey Bagayev from the Siberian Branch of the Russian Academy of Science; Anna Consortini from the University of Florence in Italy; Zohra Ben Lakhdar from the University of Tunis in Tunisia; and Valentin Vlad of the National Institute of Laser, Plasma and Radiation Physics in Bucharest, Romania.

The new chair of the Galileo Galilei award committee for the term 1 October 2008 – 30 September 2011 is Prof. Tomasz Szoplik (tszoplik@mimuw.edu.pl) from the Institute of Geophysics, Department of Physics, Warsaw University, ul. Pasteura 9, 02-093 Warsaw, Poland.

The call for nominations for the 2009 award is now open, with a deadline of 15 April 2009. Nominations should be sent to the chair of the committee. For more information, see [www.ico-optics.org/awards.html](http://www.ico-optics.org/awards.html).

## New bureau elected at ICO-21 meeting

**The 60th General Congress and Assembly looked towards Optics for the 21st Century.**

The 60th General Congress and Assembly, ICO-21, was held in Sydney, Australia, on 7–10 July 2008, with the theme "Optics for the 21st Century". The meeting was hosted by the Australian Optical Society and Engineers Australia, and more than 350 participants attended.

The hard work of John Love (general chair), Keith Nugent (program committee chair), Ari T Friberg (international advisory committee chair), Chris Walsh (local organizing committee chair) and their colleagues from the conference committee sessions, along with the support of the Optical Society of America (OSA) and SPIE, are gratefully acknowledged by ICO and resulted in an enjoyable and fruitful event.

As is traditional, the ICO General Assembly took place in two subsequent sessions. The reports of the president, secretary, associate secretary and treasurer were presented, and the various bureau committees presented their corresponding triennial reports. The election of the new bureau for the next triennial term also took place, along with the approval of the admittance of new members, and the designation of location for ICO-22.

The new bureau elected for the term 1 October 2008 – 30 September 2009 consists of – president: M L Calvo (Spain); past president: A T Friberg (Finland); secretary: A M Guzman (Colombia); associate secretary: G von Bally (Germany); treasurer: J Harrington (USA); vice-presidents: Y Arakawa (Japan), Z Bingkun (China), Z Ben Lakhdar (Tunisia), M Gu (appointed by Optics Within Life Sciences), I C Khoo (appointed by the Institute of Electrical and Electronic Engineers



Members of the old and new ICO Bureau pictured at the gates of the University of Sydney's School of Physics during the ICO-21 Congress and General Assembly meeting in July. From left to right (first row): A Wagué, M L Calvo, G Sincerbox, I Yamaguchi, R de Cecilio (ICO staff), A T Friberg and D T Moore. Second row: A Sawchuk, F Mendoza, H P Stahl, A M Guzman and M Kujawinska. Third row: G von Bally, P Török (representing the European Optical Society at the meeting), J Harrington, J Love and I C Khoo.

Lasers and Electro-Optics Society), H Lefèvre (France, from industry), F Mendoza Santoyo (Mexico), D T Moore (USA), M Oron (Israel, from industry), R Ramponi (appointed by the European Optical Society), H P Stahl (appointed by SPIE), D T Strickland (appointed by OSA), T Szoplik (Poland) and A Wagué (appointed by the LAM Network). The International Union of Pure and Applied Physics (IUPAP) Executive Council delegate is yet to be appointed.

# Sudan and Tunisia expand African presence

**ICO has welcomed Sudan and Tunisia as its newest full members.**



Members of the Sudan Committee of Atomic, Optics and Lasers Science at the University of Khartoum. Tahani S Mohamed Shatir, who is in charge of links with ICO, is standing on the left.

During the 2005–2008 term two territorial committees, Sudan and Tunisia, applied for full ICO membership. They were both accepted as members at the ICO General Assembly, which was held in Sydney, Australia, on 9 July. The president of the Tunisia territorial committees is Zohra Ben Lakhdar, a professor from the University of Tunis (see the October 2006 issue of the *ICO Newsletter*). Moreover, she was recently elected ICO vice-president at the ICO Bureau elections for the term 2008–2011, and is chairing the education committee.

The president of the Sudan territorial committee is Dr Abdelmoneim M Awadalgied, a professor in the Faculty of Engineering at the University of Karary in Sudan, and also president of the Committee of Atomic, Optics and Lasers Science at the Sudan Institute for Natural Sciences. The committee was founded in 2000, and some of its 2008 activities included a training course on laser spectroscopy applications at the University of Khartoum, and a training course in laser engineering applications at the Al-Zargaa

Complex, also in Khartoum, along with various visits to Sudanese academic centres.

The former Khartoum University College, founded in 1902 as Gordon Memorial College, became the University of Khartoum in 1956 after Sudanese independence. The Sudan Institute for Natural Sciences is a national institution under the support of the Ministry of Higher Education and Scientific Research. Since 1990 the number of public universities in Sudan has risen to 26.

With the admittance of these new members, the number of ICO African territorial committees has increased to three: Ghana/West Africa, a member since 1993; Tunisia, a member since 2006; and Sudan, a member since 2008. Morocco has also been an associate member since 2002. This is a positive step towards the increased presence of the African continent in the optics community. The General Assembly has also authorized the ICO Bureau to transform associate membership into full membership during the forthcoming triennium, as soon as the required conditions are fulfilled.

## Contacts

International Commission for Optics ([www.ico-optics.org](http://www.ico-optics.org)).

### Bureau members (2008–2011)

**President** M L Calvo  
**Past-president** A T Friberg  
**Treasurer** J A Harrington  
**Secretary** A M Guzman,  
Physics Department,  
Florida Atlantic University,  
777 Glades Road, Boca Raton,  
FL 33431, USA; e-mail [angela.guzman@fau.edu](mailto:angela.guzman@fau.edu).

**Associate secretary** G von Bally  
**Vice-presidents, elected**  
Y Arakawa, Z Bingkun,  
Z Lakhdar, H Lefèvre,  
F Mendoza, D T Moore,  
M Oron, T Szoplik

**Vice-presidents, appointed**  
M Gu, I C Khoo,  
R Ramponi, P Stahl,  
D T Strickland, A Wagué  
**IUPAP Council representative**  
To be appointed

## Forthcoming events with ICO participation

Below is a list of events coming up in 2008 and 2009 with ICO participation. For further information, see [www.ico-optics.org/events.html](http://www.ico-optics.org/events.html). (\*ICO support to be decided.)

### 13–16 October 2008

**10th International Conference on New Developments and Applications in Optical Radiometry (NEWRAD 2008)\***

Daejeon, Korea

Contact: Prof. Erkki Ikonen, tel +358 5055 02283, fax +358 9451 2222, [Erkki.ikonen@tkk.fi](mailto:Erkki.ikonen@tkk.fi), <http://newrad2008.kriss.re.kr/>

### 16–20 November 2008

**International Topical Meeting on Information Photonics 2008**

Awaji, Hyogo, Japan

Contact: Jun Tanida, [tanida@ist.osaka-u.ac.jp](mailto:tanida@ist.osaka-u.ac.jp), <http://ip2008.i-photonics.jp/>

### 14–17 December 2008

**Photonics 2008 9th International Conference on Fiber Optics and Photonics\***

New Delhi, India

Contact: Prof. Bishnu Pal, tel +91 11 2659 1327, fax +91 11 2686 5039, [bishnupal@gmail.com](mailto:bishnupal@gmail.com),

<http://web.iitd.ac.in/~photonics2008>

### 2–13 February 2009

**Winter College on Optics in Environmental Science**

Miramare-Trieste, Italy

Contact: J Niemela, tel +39 040 2240 607, fax +39 040 224163, [niemela@ictp.it](mailto:niemela@ictp.it), [www.ictp.it/](http://www.ictp.it/)

### 13–16 April 2009

**VI International Workshop Tecnolaser 2009 and II Meeting Optics, Life & Heritage**

La Habana, Cuba

Contact: Justo Ravelo Triana (for Tecnolaser), tel +53 7 209 3920, fax +53 7 202 1518, [tecnolaser@ceaden.edu.cu](mailto:tecnolaser@ceaden.edu.cu); Prof. Angel Augier, Prof. German Muniz (for Optics, Life & Heritage), tel +53 7 878 5018, [augier@instec.cu](mailto:augier@instec.cu); [muniz@electrica.cujae.edu.cu](mailto:muniz@electrica.cujae.edu.cu)

### 27–29 May 2009

**4th Asian and Pacific Rim Symposium of Biophotonics (APBP 2009)**

Jeju Island, Korea

Contact: Donghyun Kim, tel +82 2 2123 2777, fax +82 2 313 2879, [kimd@yonsei.ac.kr](mailto:kimd@yonsei.ac.kr), [www.apbp2009.org](http://www.apbp2009.org)

Responsibility for the accuracy of this information rests with ICO. President: M L Calvo, Universidad Complutense de Madrid, Departamento de Óptica, Facultad de Ciencias Físicas, Ciudad Universitaria s/n, E 28040 Madrid, Spain; [mcalvo@fis.ucm.es](mailto:mcalvo@fis.ucm.es). Associate secretary: Gert von Bally, Laboratory of Biophysics, Medical Centre, University of Münster, Robert-Koch-Str. 45, D-48129 Münster, Germany; e-mail: [lbiophys@uni-muenster.de](mailto:lbiophys@uni-muenster.de).



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