

# IAUC NEWSLETTER

INTERNATIONAL ASSOCIATION FOR URBAN CLIMATE

[www.geography.ohio-state.edu/UrbanClimate/](http://www.geography.ohio-state.edu/UrbanClimate/)

Issue No. 2  
December, 2003.



## President's Column

In the last two months since the publication of the first newsletter, the IAUC Board has made progress on a number of initiatives.

An Awards Committee has been established. Professor Robert (Bob) Bornstein (IAUC Board member) will be the first chair of this committee, other members who have kindly agreed to serve are: Maria Alcoforado (Portugal), Ingegård Eliasson (Sweden), Toshiaki Ichinose (Japan) and Ernesto Jauregui (Mexico). The committee are working to develop policy and procedures for the committee and to establish the criteria for an IAUC Award for Outstanding Contributions to Urban Climatology. More details will be provided in subsequent newsletters and through email on UrbClim.

Planning of the next ICUC meeting (ICUC6) has been initiated. I would like to thank all those that submitted proposals. The Board has selected three proposals for further consideration and is compiling further information in preparation for a vote by the IAUC membership, which will be conducted early next year.

Thank you all who have submitted ideas for the IAUC Logo. Ten logos (p7) have been suggested; please vote for the one you think best represents the organization at the IAUC webpage. In the next newsletter, we will announce the new IAUC official logo.

The preprints from ICUC5 are now available from the ICUC5 web page [this can be reached from the IAUC webpage – select ICUC – select ICUC5]. Note that these are the versions that were distributed at the conference on the CD. Since this time, more complete preprints have been submitted by some participants and individual papers have been revised. A print version of these papers will be distributed to those who attended the conference. If you would like to obtain a hardcopy, please contact [zameteo@uni.lodz.pl](mailto:zameteo@uni.lodz.pl) to obtain

## Contents

- p1. President's Column
- p2. World Climate Change Conference (Mikhail Lokoshchenko)
- p3. Hungarian branch of IAUC (Janos Unger)
- p4. IAUC Committee Reports
- p5-6 Research Projects: BUBBLE (Mathias Rotach)
- p7 Logo Competition
- p8 Upcoming Conferences  
Graduate Opportunities  
Newsletter information  
IAUC Board Information

details of costs, etc. Please express your interest soon, so that we can ensure that enough copies are printed.

I encourage you to submit articles to future newsletters. Please feel free to contact me and/or Gerald Mills if you want to discuss ideas for an article. Also, please also let us know about publications that are of interest to those who belong to IAUC. For instructions see p8.

Remember that we also have the Urban Climate email list (*Urbclim*). Postings are welcomed on all topical areas of interest to IAUC members. To send a message to *Urbclim* send your email to the list address: [urbclim@lists.acs.ohio-state.edu](mailto:urbclim@lists.acs.ohio-state.edu). Note that *Urbclim* is a moderated listserv, so that the distribution of your message will not be immediate. However, we operate with an automated system, so please do not include comments intended for the moderator in your message as s/he will have no means of removing those comments prior to distribution.

Finally, if you are attending a meeting where you think it may be useful to inform people about IAUC, I can provide you with a one page handout (pdf file) that you can distribute.

Sue Grimmond  
([grimmon@indiana.edu](mailto:grimmon@indiana.edu)).  
President, IAUC



# Conference Reports

## World Climate Change Conference (WCCC)

Moscow, Russia (Sept. 29<sup>th</sup> to Oct. 3<sup>rd</sup>)

As a participant at both ICUC5 and WCCC, I want to summarize here in brief some aspects of discussions at the WCCC that are relevant to urban climatologists. The Program of WCCC included nearly of 200 oral reports and more than 260 posters, the abstracts of which are available in English and Russian. Not surprisingly, most of discussions at the WCCC concentrated on the Kyoto protocol, which aims at reducing of the global emission of greenhouse gases by 5% compared to that in 1990. Although 120 countries have signed this protocol, the United States of America and Australia have not endorsed it. The president, Vladimir Putin, in his opening address, indicated that the Russian government would be discussing the protocol at its earliest opportunity. Thus, the WCCC meeting in Moscow was timely.

The majority of the conference was taken up with reports on observations on, and consequences of, global warming and few papers referred to specifically urban issues. For example, in his presentation, Bolin noted that global warming inevitably leads to increased atmospheric vapour content and increases the probability of strong storms at all scales. Others presented the potentially positive effects of enhanced greenhouse warming - for instance, a rise of agriculture yields, reduced heating costs, etc. It is notable that Putin joked in his address that as a result of warming, Russian people do not need expensive warm fur coats and fur caps in winter! The complexity of the issue was encapsulated by the observation of the Russian Academician, Izrael (pictured opposite), that we still don't know what a 'safe' level of atmospheric CO<sub>2</sub> concentration is.



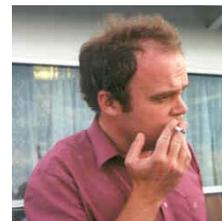
The most common urban climate issue concerned the extent of the 'urban error' present in estimates of the global temperature trend, currently stated as an increase of 0.6°C over the last 100 years. However, as most meteorological stations have been situated in cities, the process of urbanization and population growth has probably influenced this trend - especially in the earlier part of the observational record. Kondratyev was one of many that expressed doubts about the accepted global trend. Dobrovolsky, using satellite technology, indicated that the period of 1990-2000 showed a negligible rise in global air temperature compared to previous decade. However, others questioned the reliability of temperatures derived by satellite. Ginzburg and Rubinstein evaluated air temperature trends in Moscow and New York during the 20<sup>th</sup> century and concluded that, despite the urban heat island effect, the *trends* in air temperature in the city and nearby rural area were nearly identical. If this result is generally true then the urban error in global air temperature trend may not be very large.

There was no session at WCCC devoted specifically to the urban consequences of climate change. However, there were several reports at various sessions about temporal tendencies of meteorological parameters in big cities: in Moscow and Kazan (Russia), Tartu (Estonia), Tehran (Iran), and Karachi (Pakistan). The most interesting among these papers presented observations from within the city and comparisons of mean values and trends with observations outside the city. In addition to air temperature, data on precipitation amount, solar radiation and cloud amount, soil temperature, snow cover and its contamination were employed in these analyses. Finally, Zilitinkevich *et al.* presented an atmospheric model that incorporates the urban surface and applied it to Moscow with the purpose of forecasting pollution levels.

In conclusion, the World Climate Change Conference was a great event for the atmospheric sciences and the research presented is of relevance both to the climatology community generally and to urban climatologists.

Dr. Mikhail A. Lokoshchenko  
Dept. of Meteorology and Climatology  
Lomonosov Moscow State University  
Russia, 119992, Moscow, Lengory.

E-mail: [loko@geogr.msu.ru](mailto:loko@geogr.msu.ru)



# National Sections of IAUC

## Hungarian Section

The inspiration for an informal organization of urban climatologists in Hungary occurred at ICUC-5 at Łódź (Sept. 2003) where the creation of the first national Association of Urban Climatology was celebrated immediately by the Hungarian participants.



Seven IAUC members representing three different institutions in Hungary, signed a declaration of formation and Professor Tim Oke supported the idea by accepting the role of honorary President of the section (see below)

**DECLARATION**  
ON THE FOUNDATION  
OF THE *HUNGARIAN SECTION*  
OF THE *INTERNATIONAL ASSOCIATION FOR URBAN CLIMATE*

Those present, decide to found the Hungarian Section of the International Association for Urban Climate on the present day.

**Dezso Zsuzsanna**  
*Eötvös Loránd University, Budapest, Hungary*

**Gulyás, Ágnes**  
*University of Szeged, Hungary*

**Lakatos, László**  
*University of Debrecen, Hungary*

**Makra, László**  
*University of Szeged, Hungary*

**Sümegehy, Zoltán**  
*University of Szeged, Hungary*

**Szegedi, Sándor**  
*University of Debrecen, Hungary*

**Unger, János**  
*University of Szeged, Hungary*

and

**Oke, Timothy R.** as honorary president  
*University of British Columbia, Canada*

Guest and Conference Center  
University of Łódź  
Łódź, Poland, 4th September, 2003

*Dezso Zsuzsanna*  
*Gulyás Ágnes*  
*Lakatos László*  
*Makra László*  
*Sümegehy Zoltán*  
*Szegedi Sándor*  
*Unger János*  
*Tim Oke*

Our aims are

- to link those interested in urban climatology and related fields,
- to provide better opportunities to consult with each other,
- to harmonize their work and,
- to present their results in small workshops and symposia.

## Progress

Once formed, temporary office-holders were elected: Ágnes Gulyás will serve as Secretary and János Unger as President until the end of 2004. Since its formation, the original number of members has grown to 16. Now we have 3 members from the ELTE Univ., 1 from the Hungarian Meteorological Service (Budapest), 7 from the Debrecen Univ. and 5 from the Szeged Univ. Our members are university tutors, researchers, post- and undergraduate students, who are involved in any of the running urban climate projects in Hungary.

Current research activities are as follows:

- Detection of spatial and temporal variations in the urban temperature and humidity fields using mobile measurements in two cities. Statistical modeling of these fields applying different urban structure parameters.
- Evaluation of human bioclimatological conditions in different urban environments. Investigation of the connection between phenological phases and UHI (Szeged and Debrecen).
- Evaluation of the effect of traffic on air quality. Objective assessment between concentrations of the meteorological elements and air quality. Short-term forecast of air pollutants, comparison of artificial intelligence prediction techniques (Szeged).
- Installation of a new urban climate station. Analysis of the UHI effect and the airflow characteristics of the Budapest agglomeration using measurements from this station and other available datasets. Comparison of UHI effects in Budapest and other large Hungarian cities applying satellite images (sensor MODIS and ASTER). Investigation of spatial structures of day-time and night-time UHI depending on seasons, macro-circulation conditions as well as land-use types (Budapest).

A symposium was held on the occasion of the 'Day of Hungarian Science' in Szeged in early November. On this event we gave some oral presentations on the urban climate investigations in Szeged and Debrecen (see photo)



After just three months, we are at the beginning of our organization's life. I will keep you informed of our progress.

János Unger ([unger@geo.u-szeged.hu](mailto:unger@geo.u-szeged.hu))  
University of Szeged, Hungary.

# Committee Progress Reports

## Bibliographic Committee

The development of a comprehensive, user friendly bibliography encompassing the plethora of different subjects and sub-disciplines within the broad remit of 'urban climatology' is clearly an enormous task. Thus, in the initial phases of development we have decided to focus the scope and aim of this project into a manageable set of tasks and activities which can be achieved within the time frame of the next year or so. Following a series of email discussions, the IAUC Bibliography working group have therefore agreed to develop an urban climate resource by:

1. Compiling current publications: The first aim of the working group will be to provide a regular report to the newsletter consisting of a list of all recent publications that are urban climate related. We will try to include a broad spectrum of journals, the full publication details with titles translated into English and an indication of the language that the paper was published in.
2. Developing a comprehensive bibliography: The second aim of the working group will be to put together a comprehensive bibliography of all urban climate related papers which will then be made available on the IAUC website and regularly updated.
3. Reporting to the Board on an annual basis on the activities of the committee

The committee asks all readers to assist in the development of this valuable resource. In the first instance please email details of any papers in the broad field of urban climatology that you or your group has had published between Jan 2003 and December 2003 to [j.salmond@bham.ac.uk](mailto:j.salmond@bham.ac.uk). Please mark the header of your email with 'IAUC Publications 2003'. In order to facilitate entering the information into the data base please use the following format:

**Author:**  
**Title:**  
**Journal:**  
**Volume:**  
**Pages:**  
**Dates:**  
**Keywords:**  
**Language:**

A week before each bimonthly IAUC newsletter deadline we will ask for information on any papers since the last newsletter.

We look forward to hearing from you in the near future!

Jennifer Salmond,  
University of Birmingham, UK.



## Teaching Resources Committee

The goal of this committee is to produce materials that can be used by instructors to support the teaching of urban climatology. It will act as a source of, and editorial board for, short submissions on a variety of topics. These materials would, for the most part, summarize literature or demonstrate a tool. The format of each submission will follow a consistent template and will be short (2-4 pages). Once a list of topics is approved a comprehensive folder of materials will be produced.

This approach will allow us to produce relevant material quickly by identifying topics, approaching experts in the area and pursuing a regular publication schedule. From a discussion among members of this committee, a threefold division of materials is listed below along with some examples of topics.

### Urban Climate: State of the Field

- The urban heat island
- History of urban climatology
- Instrumentation
- Structure of urban atmosphere
- Cities as agents of global change
- Major urban climate field campaigns

### Urban climate tools

- Solar envelopes
- Sky view factors
- Biometeorological indices

### Climate and urban design

- Climate and architecture
- Ideal meteorological cities
- Case studies: Climate elements, urban scales,

In addition, we hope to provide sample syllabuses created by IAUC members as examples for others.

If any members wish to comment or offer advice I can be contacted at [gerald.mills@ucd.ie](mailto:gerald.mills@ucd.ie). I would be grateful if the email header indicated IAUC Teaching Committee to allow for easy identification. I hope that a template on one of the issues listed above is available for comment by the next issue of this newsletter.

Gerald Mills  
University College Dublin,  
Ireland.



# PROJECT REPORT: BUBBLE

## The Basel UrBan Boundary Layer Experiment.

Mathias W. Rotach  
Swiss Federal Office for Meteorology and Climatology, MeteoSwiss, Zurich Switzerland



BUBBLE stands for 'Basel UrBan Boundary Layer Experiment' and was an effort to investigate in detail the boundary layer structure in a mid-sized European city, namely that of Basel, Switzerland. The project is closely related to COST 715, which is part of the European COST initiative (Joffre 2002), and devoted to 'Meteorology Applied to Urban Air Pollution Problems' (Fisher et al. 2002). The philosophy of BUBBLE was to combine long-term (1-year) near-surface and remote sensing observations on the one hand with numerical and physical modeling on the other hand. It is felt that only a decent *combination of the three approaches* can lead to a substantial improvement of our knowledge in a highly complex environment as an urban boundary layer.

During a phase of intensive observation (IOP) - towards the end of the full-scale observations - a substantial number of specialized projects were performed in the city of Basel taking advantage of the extraordinary dense existing network of meteorological observations. These included studies on street canyon energetics and satellite ground-truth. The project that was linked closest to the overall goals of COST 715 consisted of a series of tracer release experiments with near-roof releases (Rotach et al. 2004).

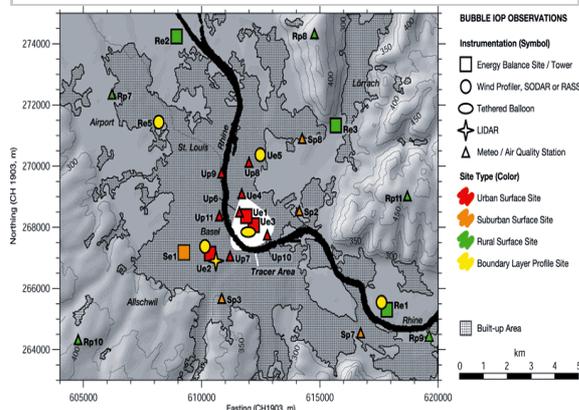


Fig. 1: Overview over the BUBBLE observational sites

Figure 1 gives an overview over the various types of observational sites that were operated during BUBBLE. At several sites over different surface types (urban, suburban and rural reference) towers up to at least twice the main obstacle height provided turbulence observations at many levels. A Wind Profiler and a Lidar near the city center profiled the entire lower troposphere over an entire year. During the IOP, urban turbulence observations and PBL profiling (sodar, RASS, tethered balloon) were both intensified.

Numerical modeling concentrated on a meso-scale meteorological model, for which an *urban surface exchange parameterization* had been developed (Martilli et al. 2001, 2003). BUBBLE data are used to validate this approach on an independent data set and to further improve it based on new observations.

The physical modeling study for BUBBLE was carried out in the new Large Boundary Layer Wind Tunnel 'WOTAN' at Hamburg University. A very detailed model (Fig. 2) with a scale of 1:300 was constructed for a region near the city center of Basel, the area where the full-scale tracer experiments had been performed. The physical model, although somewhat limited through the inherent scaling and neutral stability, will be able to provide data of much higher density than can be afforded in full-scale programs.

First results of BUBBLE have primarily been presented at conferences (Christen et al. 2003, Feddersen et al 2003, Gryning et al. 2003, Roth et al. 2003, Ruffieux et al. 2002, Salmond et al. 2003, Vogt et al. 2003, Zecha et al. 2003).

## References

- Christen A., Vogt R., Rotach M.W.: 2003, 'Profile measurements of selected turbulence parameters over different urban surfaces', *Preprints 4th International Conference on Urban Air Quality*, Prague, March 25-27 2003, 408-411.
- Feddersen, B.; Leitl, B.; Rotach, M.W. and Schatzmann, M.: 2003, 'Wind tunnel investigation of the spatial variability of turbulence characteristics in the urban area of Basel City, Switzerland', *Work-*

## PROJECT REPORT: BUBBLE

*shopProceedings PHYSMOD2003*, September 3-5, 2003, Prato, Italy, Firenze University Press, 23-25.

Fisher, B. E. A.; Kukkonen, J. and Schatzmann, M., 2002, Meteorology applied to urban air pollution problems COST 715, *International Journal of Environment and Pollution*, **16**, 560-569.

Gryning, S-E, Batchvarova, E, Rotach, M.W., Christen, A. and Vogt, R.: 'Roof level urban tracer experiment: measurements and modelling', *preprints 16th ITM on Air pollution modeling and its application*, Istanbul, May 26 - 30, 2003, 412-419.

Joffre, S.A.: 2002, 'COST cooperation in meteorology', *WMO Bulletin*, **51**, 150-155.

Martilli, A., Clappier, A. and Rotach, M.W.: 2002, 'An urban surface exchange parameterisation for mesoscale models', *Boundary-Layer Meteorology*, **104**, 261-304.

Martilli, A.; Roulet, Y.A.; Jeunier, M.; Kirchner, F.; Rotach, M.W. and Clappier, A.: 'On the impact of urban surface exchange parameterisations on air quality simulations: the Athens case', *Atmos Environ*, **37**, 4217-4231.

Rotach, M.W., Gryning, S.-E.; Batchvarova, E.; Christen, A. and Vogt, R.: 2003, 'Pollutant dispersion close to an urban surface - the BUBBLE tracer experiment', in press, *Meteorol Atm Phys*.

Roth, M.; Salmond, J.A.; Satyanarayana, A.N.V.; Christen A.; Vogt, R. and Oke T.R.: 2003, 'Turbulence characteristics, similarity and (co) spectra over an urban canyon', *preprints Fifth International Conference on Urban Climate*, September 1-5, Lodz, PL.

Roulet, Y-A.: 2003: Modeling of urban effects over the City of Basel (Switzerland) as part of the BUBBLE project, *preprints Fifth International Conference on Urban Climate*, September 1-5, Lodz, PL.

Ruffieux D., N. Tharin, and H. Berger, 2002, 'Use of a low-tropospheric wind profiler within an urban environment', *Proceedings Instruments and Observing Methods TECO-2002*, Bratislava (SL), 23-25

September, 2002. WMO Report No.25, WMO/TD-No 1123.

Salmond, J.A., Roth, M.; Oke, T.R.; Satyanarayana, A.N.V.; Christen, A. and Vogt, R.: 2003, 'Comparison of turbulent fluxes from roof top versus street canyon locations using scintillometers and eddy covariance techniques', *preprints Fifth International Conference on Urban Climate*, September 1-5, Lodz, PL.

Vogt, R.; Christen, A.; Rotach, M.W.; Roth, M.; Satyanarayana, A.N.V.: 2003, 'Fluxes and profiles of CO<sub>2</sub> in the urban roughness sublayer', *preprints Fifth International Conference on Urban Climate*, September 1-5, Lodz, PL.

Zecha, Parlow E.; Rigo, G. and Oesch, D.: 2003, 'Influence of landuse on the diurnal course of longwave emissions (NOA-AVHRR, MODIS and Landsat-ETM) during BUBBLE', *preprints Fifth International Conference on Urban Climate*, September 1-5, Lodz, PL.

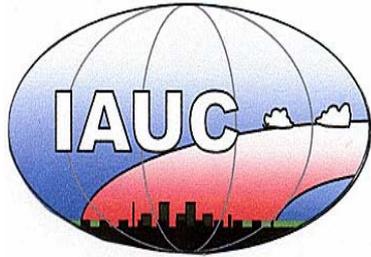


Fig. 2: Physical model in the wind tunnel of the University of Hamburg (scale 1:300) of that region in the City of Basel, where intensive observations had been performed in the field (white background in Fig. 1).

# IAUC LOGO Competition

The IAUC is currently in the process of selecting a logo for official communications. We have previously asked for your input and would like to thank everyone who has submitted their ideas. In choosing the final version, the Board would like to take your views into consideration. Please go to the following link on the IAUC website ([www.geography.ohio-state.edu/UrbanClimate/](http://www.geography.ohio-state.edu/UrbanClimate/)) to vote on the logos received and shown below. The closing date for voting is **January 31, 2004**.

1



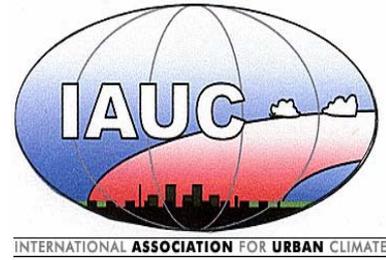
2



3



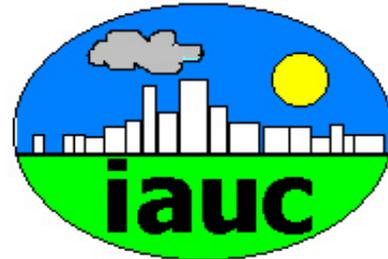
4



5



6



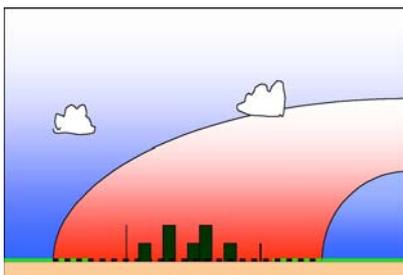
7



8



9



10



[http://www.geography.ohio-state.edu/UrbanClimate/IAUC\\_e\\_page1](http://www.geography.ohio-state.edu/UrbanClimate/IAUC_e_page1)

## Conferences

### Flow and Transport Processes in Complex Obstructed Geometries Kyiv, Ukraine, May 4 – 15, 2004



This conference hopes to bring together experts from different disciplines to present research in this field. **The agenda topics** include: Flows with distributed mass force; Flows and Dispersion in Urban Areas; Penetrable Roughness Flows in Engineering; Fires in Natural and Urban Canopies; LE Simulation of Canopy Turbulence; and Flows over Ocean during storms. **The deadline for contributions December 30, 2003.** Registration, two-page Abstracts submissions and requests for financial support should be sent to: **Institute of Hydromechanics, Ukrainian Nat. Academy of Sci., NATO ASI on Flows, Zhelyabov str., 8/4, 03057, Kiev, Ukraine,** or via electronic addresses: **FB\_FLOWS@kiev ldc.net** and **ASI\_Kyiv@ua.fm.** **More information may be found at the IHM web site: [www.hydro-mech.kiev.ua/eng/news.htm](http://www.hydro-mech.kiev.ua/eng/news.htm).**

### The 5<sup>th</sup> Symposium on the Urban Environment, Vancouver Canada, 23 -27 August 2004.



The symposium is being held in conjunction with the 26th Conference on Agricultural and Forest Meteorology, the 13th Joint Conference on the Applications of Air Pollution Meteorology with the Air and Waste Management Association, and the 16th Conference on Biometeorology and Aerobiology. Please submit your abstract electronically via the Web by 7 April 2004 (refer to the AMS Web page at <http://www.ametsoc.org/AMS> for instructions.)

## GRADUATE STUDENT OPPORTUNITIES

### Department of Geography, National University of Singapore, Singapore.

Fully funded (through competitive research scholarships) MA and PhD opportunities exist for graduate students interested in tropical urban climatology. Interested students with strong science backgrounds as well as those with prior training in atmospheric sciences, climatology or physical geography are encouraged to apply. More information about the graduate program at NUS: [www.fas.nus.edu.sg/grad/gradprog\\_introduction.htm](http://www.fas.nus.edu.sg/grad/gradprog_introduction.htm). For further information please contact Dr. Matthias Roth.

## NEWSLETTER INFORMATION

The IAUC newsletter is a bimonthly publication. The next issue will be published after the first week in February and we are anxious to receive contributions from members on a range of topics including reports on: conferences; research projects; urban climate in the news, etc. The newsletter contents are still being developed so we would be happy to receive comments or suggestions. The deadline for receipt of materials for the next newsletter is **January 30, 2004.** Submissions should generally be short (1-2 pages) and include graphics. For any communication regarding the newsletter please contact [gerald.mills@ucd.ie](mailto:gerald.mills@ucd.ie) and indicate *IAUC Newsletter* in the subject box.

### Correction

In the last issue of the IAUC Newsletter, the paper presentation of Andreas Christen (University of Basel) was listed as one of those selected as exceptional at ICUC-5 in Łódź. However, the incorrect paper title was published. The correct paper was as follows:

Christen, Bernhofer, Parlow, Rotach and Vogt: *Partitioning of turbulent fluxes over different urban surfaces.*

## IAUC INFORMATION

### Board Members

*President:* Sue Grimmond (Indiana Univ., USA), 2007  
*Secretary:* Matthias Roth (National Univ. of Singapore, Singapore), 2007  
Janet Barlow (Univ. of Reading, UK), 2007  
Arieh Bitan (Tel Aviv Univ., Israel), 2006  
Bob Bornstein (San Jose State Univ., USA), 2005  
Krzysztof Fortuniak (Univ. of Lodz, Poland), 2007  
Helmut Mayer (Univ. of Freiburg, Germany), 2004  
Gerald Mills (Univ. College Dublin, Ireland), 2007  
Yasuto Nakamura (Prefectural Univ. of Kumamoto, Japan), 2005  
James Voogt (Univ. of Western Ontario, Canada), 2006

Non-Voting members of the Board:

*Past Secretary:* John Arnfield (The Ohio State Univ., USA)  
*Past President:* Tim Oke (Univ. of British Columbia, Canada)  
*Local Organizer ICUC5:* Kazimierz Klysik (Univ. of Łódź, Poland)

### Committee Chairs

Editor IAUC Newsletter: Gerald Mills  
Chair Bibliography Committee: Jennifer Salmond  
Chair Membership Committee: Janet Barlow  
Chair Teaching Resources: Gerald Mills  
Chair Awards Committee: Bob Bornstein  
WebMasters: John Arnfield and James Voogt