IAUC NEWSLETTER

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Issue No. 13
October, 2005.

President's Column

The deadline to submit abstracts for ICUC6 **(November 10th)** is fast approaching! I hope that many of you will be submitting abstracts, either for oral presentations or posters. The abstract fee is paid only once – just for the first paper submitted by an author. So, if you have results from more than one study to present, I recommend you consider both an oral presentation and a poster. To submit an abstract, follow the links from the main webpage www.urban-climate.org. Please do forward information about ICUC6 to colleagues in appropriate organizations. The scientific committee will work on the program soon after the deadline, and we hope to have information out to you about paper acceptance and the conference early in the new year.

Again, the newsletter has a number of interesting features and articles. There are two very interesting country reports (Iran and Nigeria), a review of Tokyo's thermal map, an overview of the Helsinki Mesoscale Test bed, a new set of recently published articles on urban climate, and a profile of our 1000th member! I want to thank all of you who have submitted contributions to the newsletter, and to encourage more of you to do so!

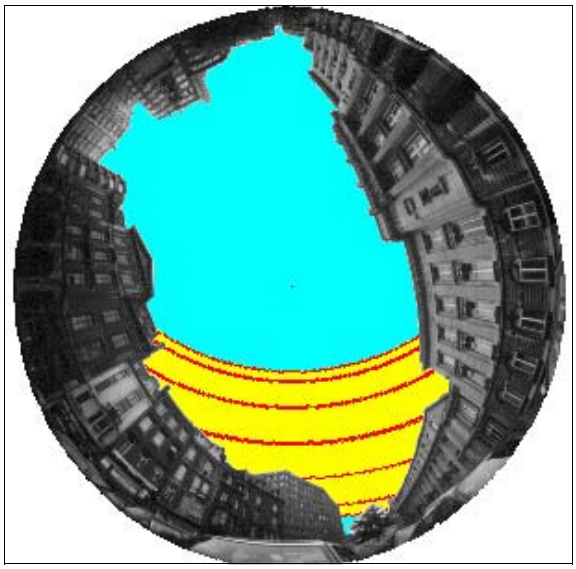
Sue Grimmond
IAUC President.
(grimmon@indiana.edu)

Contents

Emissions from the coal-based power plant in Kanpur, India viewed from the vantage of the campus of the Indian Institute of Technology campus. Photograph courtesy of Ramesh P. Singh: Professor, Department of Civil Engineering at Kanpur. A report on urban climate research in India will appear in the next edition of the IAUC Newsletter.

Downtown Helsinki
showing the harbor area and Gulf of Finland (source: Google Earth).
The Finnish Meteorological Institute and the Vaisala meteorological measurements company together with other public, private and academic partners have initiated plans for a new mesoscale observation network testbed – the Helsinki Testbed - in Southern Finland. The testbed is an open program and collaborators are encouraged to participate. See p11.

Urban Climate News



The visual representation of a numerical analysis completed on a fisheye image for the insolation of a point on the "Place du XX-aout" in Liege, Belgium (50°N). The bright/yellow areas correspond to the path of the sun over a year. The dark/red stripes correspond to day 21 of each month (21/6 is the inner arccircle, 21/12 the outer one almost invisible). Image courtesy of Bernard Cornélis (SPIRAL & HECharlemagne)

Newsletter Contributions

The IAUC Newsletter is published bi-monthly. The next publication will occur in early December. Any items to be considered for the December edition should be received by **November 30, 2005.**

The following individuals compile submissions in various categories. Contributions should be sent to the relevant editor:

News:	Dr. J. Marshall Shepherd marshall.shepherd@nasa.gov
Conferences:	Jamie Voogt (javoogt@uwo.ca)
Websites:	Gerald Mills (gerald.mills@ucd.ie)
Bibliography:	Jennifer Salmond (j.salmond@bham.ac.uk)
Urban Projects:	Sue Grimmond (grimmon@indiana.edu)

General submissions should be relatively short (1-2 A4 pages of text), written in a manner that is accessible to a wide audience and incorporate figures and photographs where appropriate.

In addition we would be delighted to receive any images that you think may be of interest to the IAUC community.

We welcome submissions to the "News" section. Submission materials could include but are not limited to: upcoming papers, field experiment information, awards, data or document availability announcements, etc. You may submit your "news item" to Dr. J. Marshall Shepherd

(marshall.shepherd@nasa.gov).

City Summit in London on Climate Change

Representatives from more than 20 of the world's major cities met on October 4th, 2005 in London to discuss climate change. The World Cities Leadership Climate Change Summit discussed ways of addressing what London Mayor Ken Livingstone said were the "inevitable effects" of climate change.

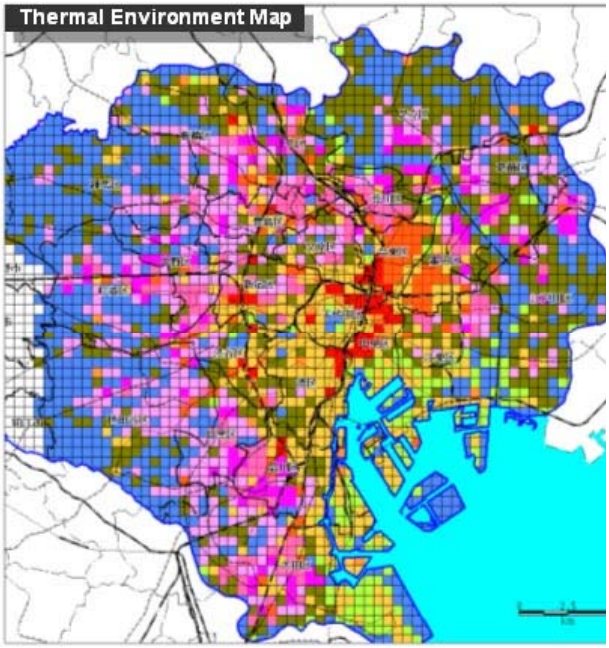
Mayors and senior figures from the cities exchanged ideas and develop strategies to tackle the effects of climate change. A dozen smaller cities will also show how they are already tackling the problem. Steve Howard, chief executive of The Climate Group, said: "More than half of the world's population now lives in cities. "We are fast becoming an urban world and so cities must play a pivotal role in leading on climate change action if we are to combat this problem. We will not be able to solve climate change without cities taking a central role. Mayor of London Ken Livingstone said: 'Large cities are among the most significant sources of greenhouse gas emissions in the world – the percentage of world energy use accounted for by cities in 2005 is 75 per cent. But it is also at the city level that innovation and progress on climate change action are most likely to be achieved. This week's conference brings together those city leaders who are taking the most productive and radical steps to adapt to and mitigate climate change, to share ideas and provide leadership to the rest of the world.'

London's Mayor 'offset' the carbon dioxide emissions resulting from all travel to the summit. The European Climate Exchange (ECX) has purchased and retired 300 tonnes of CO2 permits on behalf of the Mayor of London. The City Summit should add significant momentum improving transport systems, reducing emissions, and greening energy use. [From a City of London press release]

A complete list of the talks is available on the City of London website (http://www.london.gov.uk/mayor/environment/climate-summit/index.jsp)

Urban Climate in the News

Tokyo's Thermal Map



Tokyo's Metropolitan Government ("TMG") has produced a Thermal Environment Map, showing the atmospheric impact (thermal loading) of anthropogenic heat (caused by humans) and ground surface conditions, which are understood to be factors contributing to the incidence of the Heat Island Phenomenon in Tokyo's 23 wards. Based on this map, the TMG has designated four specific areas for the implementation of measures against the Heat Island Phenomenon.

As part of Tokyo's future urban renewal, the "designated areas for the implementation of measures against the Heat Island Phenomenon" (referred to below as the "Designated Areas") will be used as a guide for private sector redevelopment projects, as well as to focus such efforts as water retentive paving, the introduction of greenery along walls, and planting lawns in school grounds.

The Designated Areas were selected on the basis of the following:

- Based on the Thermal Environment Map, areas (business cluster areas and high-density residential areas) which have a large impact (thermal loading) on the atmosphere were isolated.
- Focus was given to the Priority Areas for Redevelopment for the Urban Renewal of Tokyo where environmentally-conscious private sector development is possible.
- In addition to the above, areas chosen were those where urban development should be systematically directed, while projecting future widespread development and incorporating preventative heat island measures.

Thermal Environment Map

The map shows the distribution of factors contributing to the Heat Island Phenomenon, resulting from anthropogenic heat and the ground surface of different districts. 17 regional factors for the Heat Island Phenomenon have been grouped into five classifications based on their thermal environment characteristics, and have been plotted onto a 500-meter grid.

The grid has been color-coded depending on the relative size of the loading on the atmosphere, for Type I (business cluster) and Type II (high-density residential) areas.

The Thermal Environment Map enables us to appreciate the regional distribution of factors contributing to the Heat Island Phenomenon, and also the magnitude of their thermal loading on the atmosphere.

Examples of Initiatives in the Designated Areas

Examining the implementation of "wind or ventilation paths" facilitating clear avenues for breezes to pass through the city (areas including the Shinagawa vicinity). Guidelines for a plan to secure wind paths mostly in areas where it is envisioned major development will be undertaken, such as the JR railway yard (pictured) are under consideration

Water retentive paving. To be implemented in the Central Tokyo Area and Shinjuku Area (FY 2005) Road surface watering

Water to be sprayed using a road sprinkler in such districts as Shiodome and Marunouchi

From the Tokyo metropolitan government website (http://www.metro.tokyo.jp/)

Country Report

Urban climate research in Iran

Fig. 1 Geographic location of Iran in south west Asia

Introduction

Iran is a mostly a semi-arid country situated in the extra-tropics in Southwest Asia, with a population of approximately 67.5 million (Statistical Centre of Iran 2004 estimate). The area of the country is about 1,648,195 km^2, roughly the same size as Alaska (Fig 1).

Although urban settlements have existed for thousands of years in Iran (once called Persia), in recent decades they have seen an unprecedented growth. Population in urban areas has grown from 31.4% in 1956 to an estimated 67% in 2004. According to the 1996 census, four cities (Karaj, Ahwaz, Qom and Kerman shah) have populations between 500,000 – 1,000,000; four cities (Mashad, Esfahan, Tabriz and Shiraz) between 1,000,000 – 2,000,000; and the biggest city, Tehran (the Capital) has a population of over 6,700,000 (Statistical Centre of Iran 1996 Census).

The University of Teheran was established in 1934, with Geography being one of the founding Departments. Teaching and research activities in different aspects of Geography started in 1963 when the Faculty of Geography was established as an independent entity from the University of Tehran (from 2000 the Faculty of Geography includes: Physical Geography, Human Geography and Cartography Departments). Presently, there are more than thirty departments of geography around Iran in various locations. The development of geography has paralleled development in the field of climatology in the last two decades. Today, more than ten universities offer Masters Degrees, and seven universities offer PhD degrees in climatology. Within climatology, research tends to focus on urban climatology, synoptic climatology, and agricultural climatology.

Urban climatology

In Iran, routine meteorological observations started 60 years ago, while the Iranian Meteorological Organization was established about 1951. Although the necessity for urban climatology research has become more important with urban growth, lack of suitable data still hampers efforts. Until now, only data from weather stations are available for investigations of urban climatology. Most research programmes have focused on the metropolitan areas of Tehran and only a few have looked at other big cities like Esfahan, Mashad, Tabriz and Shiraz.

Air pollution in Tehran

Fig 2 – Visibility in Tehran on a polluted day. (http**://i-cias.com/e.o/teheran.htm).**

Fig 3 – Visibility in Tehran during a clean episode (http**://i-cias.com/e.o/teheran.htm).**

Country Report

Analyses of temperature records for most Iranian urban areas (see Figures 4-15) show decreasing difference between average annual maximum and minimum temperatures through time regardless of geographic or climatic conditions (Tabriz is in the northwest of Iran, Anzali in the north, Tehran, Doushan Tappeh and Shahroud in southern slope of Alborz, Yazd and Esfahan in centre, Shiraz in south, Zahedan in southeast, Ahwaz in southwest, Boushehr in coast of Persian Gulf and Kish as an Island in Persian Gulf). This is due to a positive trend in minimum temperatures which occurs mostly at night (Azizi 2003).. Most Iranian urban areas show such trend in time despite their geographic or climatic conditions.

To date there are only a few studies that look specifically at urban climatology issues. Arefi et al. (1996) studied the urban heat island (UHI) by remote sensing, while Bidokhti et al. (2002) investigated the interactions of mountain induced circulation and the UHI in Tehran. Sepehri (2003) characterised the daily, monthly and annual boundary layer behaviour from the spatial distribution of sulphur dioxide in Tehran. Azizi (2003) studied time series of data from Mehrabad airport. He concludes that the climatic trend in Tehran is due to land cover change and air pollution due to urbanisation. In addition, he found that the minimum relative humidity and absolute humidity show a rising trend with an average rate of about 5.12% per year and 0.8 g/m^3, respectively (trend

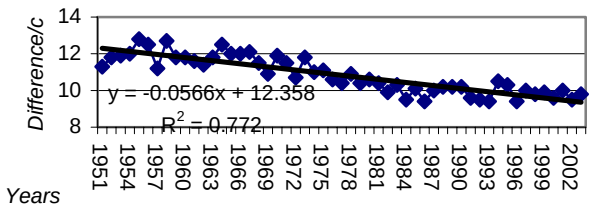


Fig 4 - Difference Between Average Max and Min temperature in Tehran

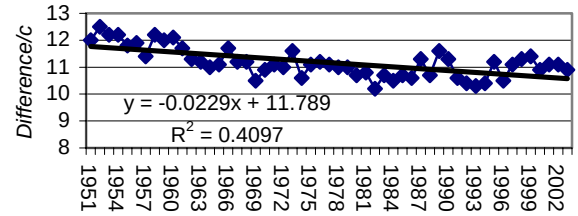


Fig 7 - Difference Between Average Max and Min temperature in Tabriz

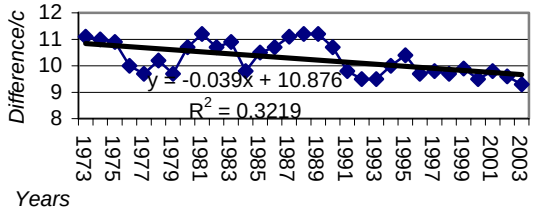


Fig 5 - Difference Between Average Max and Min temperature in Doushan Tappeh

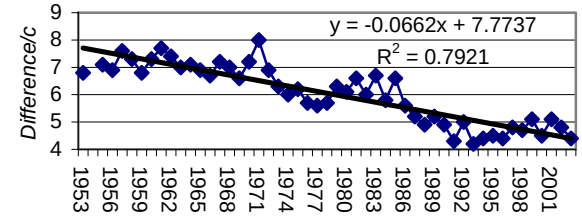


Fig 8 - Difference Between Average Maximum and Minimum temperature in Anzali

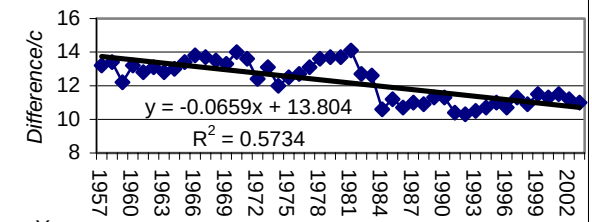


Fig 6 - Difference Between Average Max and Min temperature in Shahroud

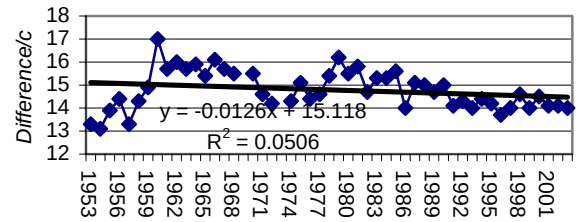


Fig 9 - Difference Between Average Maximum and Minimum temperature in Yazd

for the past 45 years). The increase of relative and absolute humidity he suggested is due to increase of green space in Tehran (as an arid urban area) and evaporation from its surface and also due to the use of about 2.5 million water coolers (air conditioners using water) in summer time. Nouri et al. (2004) investigated simulation of thermal stratification in Chitgar Lake, an urban human-made lake in District-22 Municipality in the north–west of Tehran, and after running a model they suggested that on the base of the simulation results the Kan River, as one of the proposed water resources, has the best condition in term of thermal stratification.

Air pollution

Along with other receptor effects, air pollution in urban areas normally causes severe degradation in visibility. In the seven biggest cities, the main source of air pollution is vehicles, with domestic emissions and industrial activities contributing. The Japan International Co-operation Agency (JICA) estimates that roughly 71% of air pollution in Tehran is produced from mobile emission sources. Tehran is amongst a few capitals in the world, which is not located on a river or even close to the sea (Asadollah-Fardi 2001). High mountain ranges surround the city to the north,

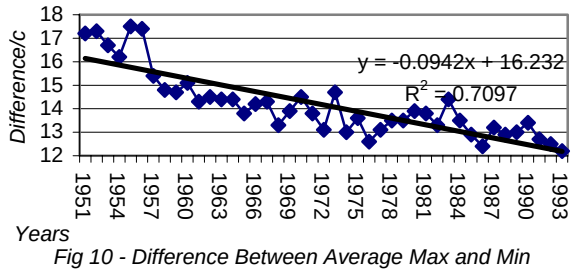


Fig 10 - Difference Between Average Max and Min temperature in Esfahan

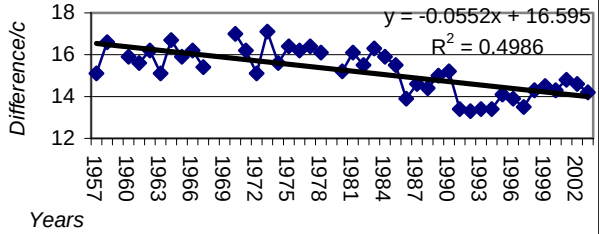


Fig 13 - Difference Between Average Max and Min temperature in Ahwaz

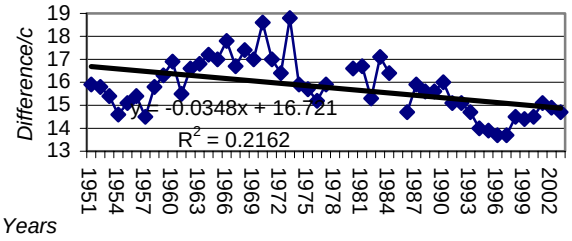


Fig 11 - Difference Between Average Max and Min temperature in Shiraz

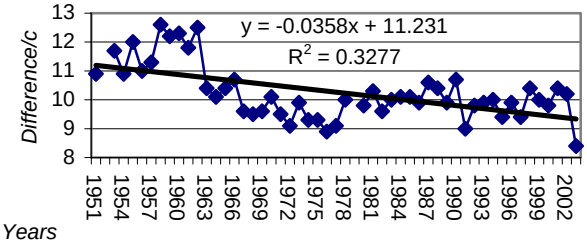


Fig 14 - Difference Between Average Max and Min temperature in Boushehr

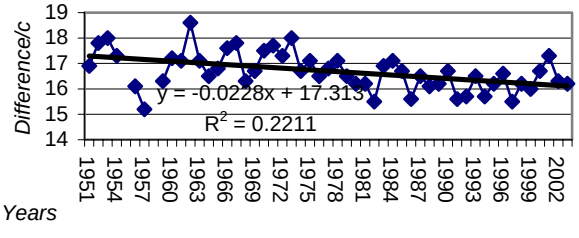


Fig 12 - Difference Between Average Max and Min temperature in Zahedan

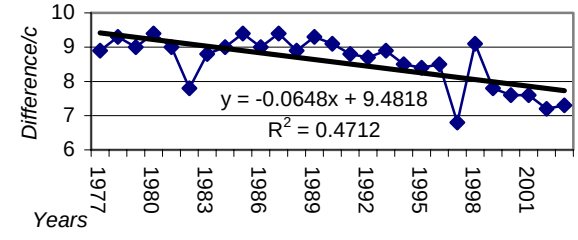


Fig 15 - Difference Between Average Max and Min temperature in Kish

east and west leading to mostly stagnant wind condition most of the time. Recently, the Municipality of Tehran has established an Air Quality Control Company (AQCC) in 1993 (Asadollah-Fardi 2001). Based on data collected by the AQCC, Tehran is one of the worst cities in the world in terms of air pollution. The increase of urbanisation in Tehran will increase energy consumption, which will increase air pollution relating to domestic sources in the future (Japan international Co-operation Agency; Asadollah-Fardi 2001). According to Shirazi and Harding (2001), there was a statistically significant upward trend in air pollution levels for all measured pollutants, except NO_2, between 1988 to 1993. All pollutants except TSM routinely and substantially exceeded W.H.O. guidelines. These findings suggest that as the population continues to grow, and increasing numbers of motor vehicles are driven in Tehran, there is concern for the health effects that may result from exposure to these pollutants.

In conclusion, although Iran has many cities that have populations of over 500,000 people and that suffer from air pollution and UHI effects, research in this area is still in its infancy.

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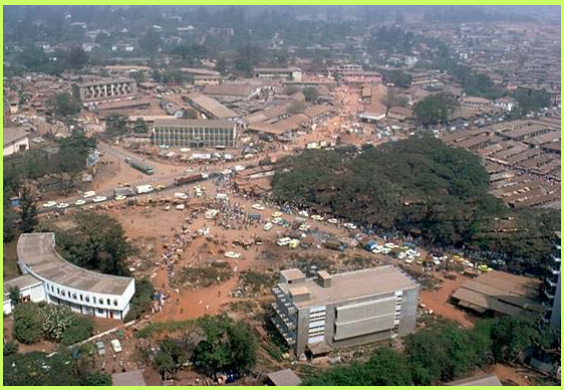
Country Report

Urban climate research in Nigeria.

The study of urban climate is still at an infancy stage in Nigeria. It is worthy of note that the study of climatology in Nigeria largely developed from the Department of Geography, University of Ibadan, Nigeria. Although some research work on the meteorology and climatology of West Africa had been carried out since the beginning of the Twentieth Century by the Nigerian Meteorological Services, it was not until the founding of the University College, Ibadan in 1948, which later became the University of Ibadan that the development of climatology in Nigeria was fully established. Most climatologists in the country therefore have their roots in Ibadan. The majority of urban climate studies in the country emanate from postgraduate research in climatology at the University of Ibadan. Thus the first fruits of urban climate studies were undertaken in the city of Ibadan, the largest truly indigenous city in Sub-Saharan Africa.

Although serious attempts at studying the climates of urban centres commenced in the 1970s, very few studies have been undertaken subsequently. The reasons for the relative paucity of urban climate studies in Nigeria relate to the availability of requisite personnel, data and funds. Firstly, scientists with specialty or interest in the field of climatology are very few in the country and of these few, most are interested with studies of rainfall and related matters such as agroclimatology that are perceived as being immediately relevant to the needs of the society. The lack of suitable data has also served as a deterrent to studies on urban climate. Conventional data from meteorological archival records are inadequate for urban climate studies. Most meteorological stations in the country are usually located at airports, which are in most cases sited on the periphery of cities. These can serves as 'rural' sites and the problem of obtaining climatic data representative of the urban site therefore arises. This makes the collection of individual readings imperative if one is to monitor urban influence on climate. Funds are therefore required to set up temporary weather stations and the financial aspect of actualizing this often poses a limitation to conducting such studies. Consequently, only a handful of urban climate studies have been undertaken in the country even though Nigeria is arguably the most urbanized country on the African continent.



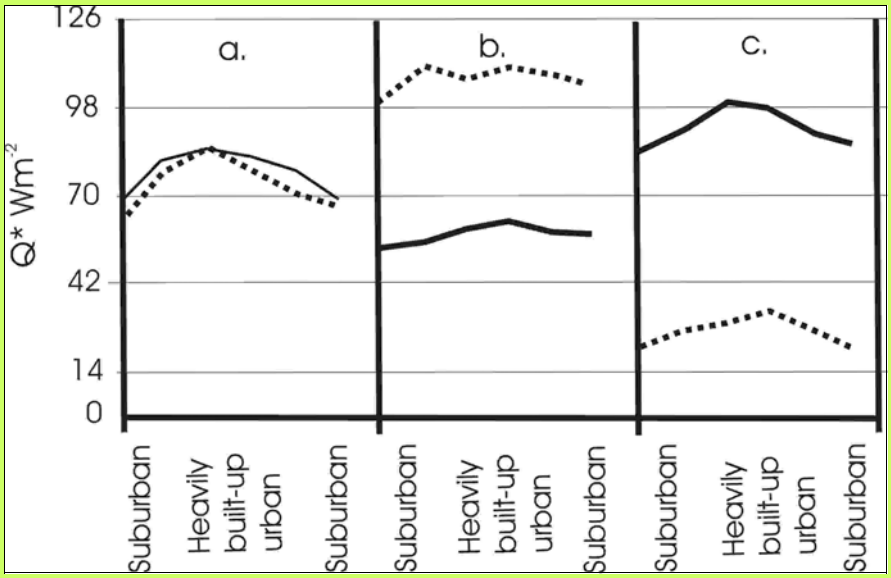
Aerial image of Ibadan, Nigeria from www.africawithin.com/ tour/nigeria/ibadan1.jpg

The earliest documented urban climate research was that of Oguntoyinbo (1970) in which he studied the albedo and reflection fluxes of urban and rural surfaces in Ibadan. His findings indicated a mean albedo of 12 percent for urban surfaces and 15 percent for rural surfaces. Oguntoyinbo (1973) further examined the impact of urbanization on the climate of Ibadan. In this study, temperature and relative humidity data were collected across the city during the daytime using simple thermohygrographs and whirling hygrometers. Primary data collected were complemented with data from the airport and other agrometeorological stations within the city. The study indicated 7% lower relative humidity in the city during the daytime.

Since the pioneering works by Oguntoyinbo, other urban climate studies were undertaken in the 1980s, largely on the issue of the urban heat island phenomenon (e.g. Ojo, 1981; Adebayo, 1985; Omogbai, 1985; Aina, 1989; and Oniarah, 1990). A common characteristic of all these studies is their empirical nature. Ojo (1981) studied the spatial and temporal variation of temperature across the city of Lagos using temperature data taken from traverses across the city. Findings of the investigation showed the urban heat island effect of 2^0C to 4^0C in the zone of dense traffic and main traffic corridors of Mushin/ Oshodi areas of the city at noon or in the late afternoon. Ojo (1981) also examined the land-use energy balance relationships in metropolitan Lagos.

The first comprehensive urban climate study, however, is that of Adebayo (1985) in which he analysed the spatial, diurnal and sea-

Net radiation traverses across major land uses in Ibadan, Nigeria. The graphs represent:
(a.) a 'normal' cloudless calm day,
(b.) a bright morning, followed by partial cloud and rain in the afternoon and
(c.) Cloudy and rainy morning followed by a bright afternoon.



Broken lines represent measurements made between 0600 and 1200 hrs. and solid lines, measurements between 1200 and 1800 hrs.

(Redrawn from Fig. 5 in Adebayo, Y.R. 1990. Aspect of the variation in some characteristics of radiation budget within the urban canopy of Ibadan. Atmospheric Environment 24B, 9-17.

sonal characteristics of global radiation, surface albedo, net long wave radiation, and latent and sensible fluxes of energy for Ibadan city. The study was based on data collected on a daily basis (0600-1800) hours GMT for one year of twenty stations located all over the city. The study showed that global radiation values for different land uses ranged between 0.62 and 0.64 ly min^{-1} in the urban centre – a decrease of about 14 percent. The effects of the pollution veil and the reduced sky view factor within the canopy were identified as being responsible for the decreasing global radiation towards the city centre. Mean values for albedo ranged between 15 and 18% in the rural areas to between 8 and 10% in the city centre, while the net radiation at the urban centre was about 15% higher than that of the rural area. Decreases in surface albedo, and therefore increases in the amount of energy absorbed at the surface, and longwave radiation by atmosphere pollutants are factors responsible for the increase in net radiation toward the centre of Ibadan city. It was also shown that net long wave radiation in the city centre increased by as much as 16.7% over the rural environment. The study also indicated a decrease in relative humidity from 80% in the rural area to 75% in the urban centre during the wet season. During the harmattan season, relative humidity decreased from a mean of 37% in the rural areas to 29% in the urban centre. The urban heat island effect was also described for the city of Ibadan. During the wet season, an increase of 1.0^0C to 1.5^0C in the temperature towards the city centre was observed. The effect was more pronounced during the harmattan season with a temperature difference of 2.5^0C to 3.0^0C and in the middle of the dry season a temperature difference of 8^0C was observed. This value observed by Adebayo (1985) is quite high compared to the 3.6^0C – 4^0C in the afternoon of November observed by Oguntoyinbo (1973) for Ibadan. Factors responsible for this marked difference include the fact that the studies were undertaken within a time interval of twelve years of each other. Within this period, Ibadan had witnessed rapid expansion due to a spate of development projects sited in the city between the early 1970s and early 1980s. This expansion contributed to the influx of migrants into the city thereby increasing the human population from 847,000 in 1975 to 1.1 million in 1985. Also, there was rapid expansion of the urban area into its rural surroundings during this period. Much of the original city landscape was thus transformed to concrete surfaces and structures.

This pattern of development has continued in many urban centres in the country such that the urban canopy in cities across the country has witnessed marked transformation. Cities have changed from comprising largely low-single storey buildings to multi-storey buildings. Zinc and asbestos roofing sheets are also giving way

to aluminum roofing sheets with resulting changes in radiation characteristics of the surfaces.

The contemporary urban morphology of Nigerian cities is therefore very different to that of the 1970s and 1980s. However, virtually nothing has been done to update the state of knowledge of the urban climate of these cities.

Also, monitoring of atmospheric pollution resulting from vehicular traffic in urban areas has been undertaken. Oluwande (1977) measured the level of pollution resulting from vehicular exhaust in Ibadan for one year and noted that the level of atmospheric dust was higher during heavy traffic and the dry season than the wet season.

One aspect of urban climate that currently is receiving attention in the country is the effect of atmospheric pollution on the urban environment especially in the Niger Delta area where a lot of oil exploration activities and gas flaring is going on. Efe (2004) examined the effect of the urban landscape on precipitation and rainwater quality in Warri, an 'oil city', with many large-scale industrial complexes that pollute the atmosphere. The city of Warri is one of the large and rapidly growing cities in the Niger Delta. The population of Warri increased from 280,000 in 1980 to over 500,000 in 1991. Its urban characteristics are an amalgam of the traditional and modern. The methodology of the study entailed the collection of data on rainfall amount and quality, and particulate matter for a one-year period from 34 sites spatially distributed over various land use types of the urban landscape and surrounding rural environment. Findings of the study showed that rainfall in the urban area is 18.5% greater than the surrounding rural areas of Warri metropolis. Also, there is 4% variation in precipitation within the urban canopy. The industrial areas are the wettest landuse types with 3051.2 mm annual rainfall, while the low-density residential areas recorded 2939.4 mm of rainfall. The high rates of particulate matter, increased incineration of refuse, exhaust fumes from automobiles, and low wind speed that characterize the urban areas are some of the factors responsible for increased rainfall in the city of Warri. The annual mean PM 10 amount for Warri was 126.5 µg/m^3, which is 81% higher than the 70 µg/m^3 threshold of WHO. Similarly, the urban areas of Warri metropolis are more polluted with PM10 than the surrounding rural areas by over 150%, as evident from PM10 amounts of 139 µg/m^3 and 54.2 µg/m^3 for the urban and rural areas, respectively. There is also wide spread occurrence of acid rain in Warri with records of mean pH of 5.33 and 6.33 in the urban and rural areas, respectively. The incidence of acid rain is largely due the prevalence of NO_3^- and SO_4^{2+} in the urban atmosphere. Other cities in the Niger Delta including Port Harcourt are also experiencing climatic effects of urbanization and rapid industrialization.

Much work is yet to be embarked upon in urban climate studies in Nigeria if a thorough understanding of the effect of urbanization on the climate of Nigerian cities in their different climatic and physical settings is to be gained.

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The Helsinki Mesoscale Testbed
An invitation to use a new 3-D observation network

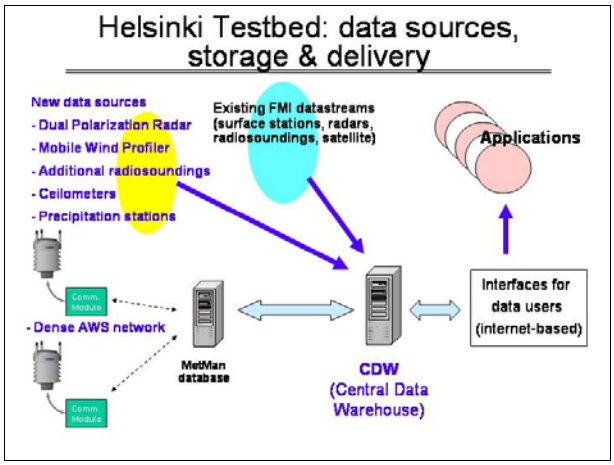
A recent community workshop organized through the U.S. Weather Research Program and described in the *Bulletin of the American Meteorological Society* (86(6), 961-982) recommended enhanced three-dimensional mesoscale observing networks as critical to advancing numerical and empirical modeling for a broad spectrum of mesoscale applications, including severe weather warnings and forecasts, hydrology, air quality forecasting, chemical emergency response, transportation safety, and energy management. The workshop concluded that the mesoscale measurement challenge can best be met by an integrated approach that considers all elements of an end-to-end solution: identifying end users and their needs; designing an optimal mix of observations; defining the balance between static and dynamic (targeted or adaptive) sampling strategies; establishing long-term testbeds; and developing effective implementation strategies. Mesoscale testbeds are widely recommended as the bridge from research to operations.

The Finnish Meteorological Institute and the Vaisala meteorological measurements company together with other public, private and academic partners have initiated plans for a new mesoscale observation network testbed – the Helsinki Testbed - in Southern Finland. The testbed is an open program and collaborators are encouraged to participate. Many types of collaboration are possible, such as testing new measurement systems and sampling strategies, conducting mesoscale modeling and special-purpose field campaigns, evaluating alternative forecasting methods, and so forth.

The Helsinki Testbed provides new opportunities for measuring, studying, and predicting atmospheric processes and applications in a high-latitude coastal environment (60º-61ºN, 24º-26ºE) encompassing southern Finland including the Finnish capital city and the Gulf of Finland. The testbed also provides comprehensive data sets for many other research and operational purposes, such as advanced nowcasting methods and mesoanalyses, remote sensing of different precipitation types, air quality forecasting, emergency-response dispersion modeling, electric power and fuels management, road surface and related weather modeling, and development and verification of numerical weather prediction models. The program seeks to enable and promote testing of scientific theories, new technologies and end-user applications with a focus on urban challenges. It also serves as an open platform for instrument and model development projects and provides a framework for atmospheric information systems integration.

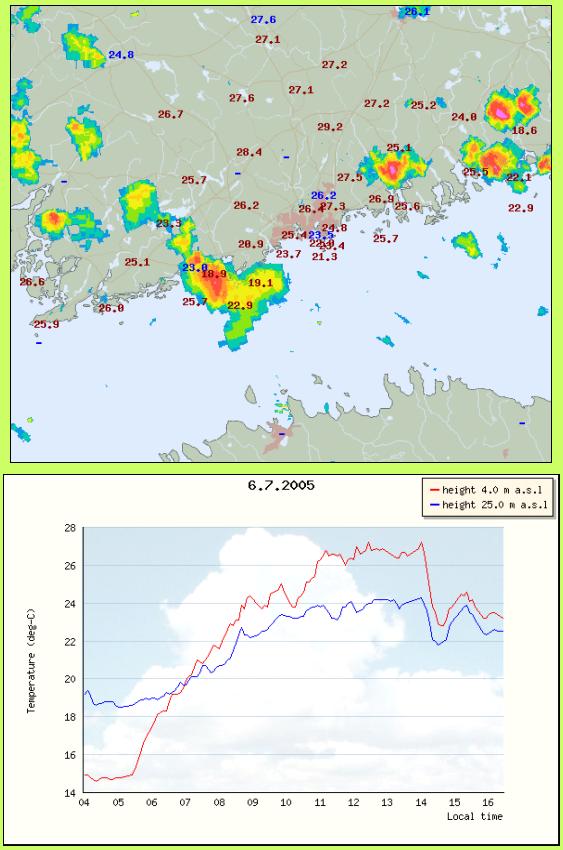
Helsinki Harbor (left) and a typical downtown residential street (above)

Urban Project Report



First tests of the Helsinki Testbed occurred in August 2005, in support of the World Championships in Athletics. Data sets will be available from each of five month-long, thematic measurement campaigns. The last campaign is scheduled for August 2006, although an extension is under consideration. The existing Finnish weather observation network is already very extensive, and has been supplemented with a large number of new observations. Most of the new observation sites are located in and around Helsinki metropolitan area in a 150-by-150 km domain. In particular, 42 communication masts (60-100 m high) have been equipped at two levels with new "weather transmitters" that measure temperature, humidity, air pressure, rain, and wind. During the month-long intensive periods, radio soundings will be made at four sites, together with a variety of continuous remote sensing measurements including 11 lidar-ceilometers, a new radar wind profiler, remotely sensed observations from a total-lightning network, five weather radars, and multiple European and U.S. satellites; for details, see http://www.fmi.fi/testbed.

All measured and model data are made available through a portal on the Internet. Individuals and organizations interested in participating should visit the website for contact information. There is no charge to participate in the program or acquire data from the Web portal, but on-site participants must provide for their own special support needs.



Public 'real-time' data available durin intensive field campaigns (http://testbed.fmi.fi)

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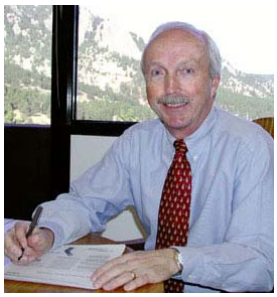
(Photo by Carlye Calvin from http://www.ucar.edu/)



Jarmo Koistinen (jarmo.koistinen@fmi.fi) and Jani Poutianinen (jani.poutiainen@fmi.fi) of the *Finnish Meteorological Institute, Helsinki, Finland.*

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Conferences

23rd International Conference on
Passive and Low Energy Architecture

Geneva, Switzerland 6-8 September 2006.

Clever design, affordable comfort:
A challenge for low energy architecture and urban planning.

In a world undergoing profound change at energetic, environmental, social and economic levels, the work of the architect and urban designer has to evolve. At the end of the 20th century, research and pilot experiments allowed knowledge and techniques in favour of a sustainable built environment to develop. The concern of today is to bring them into use through a multidisciplinary approach which integrates technical and architectural aspects, social preoccupations and economic data. In this context, the rational use of energy and the implementation of renewable energies are highly necessary, and this requires more intelligence and time for the project.

The conference, which will be held in Geneva in September 2006 aims to emphasize the importance of considerations and experiences favourable to the development of an intelligent, sustainable built environment, accessible to all.

Topics for contributions

1. Lessons from traditional architecture
2. Design strategies and tools
3. Comfort and well-being in indoor and outdoor spaces
4. Indoor comfort in glazed buildings
5. Research and technology transfer
6. Strategies and tools for renovation
7. Architectural education for sustainable design
8. Examples of low energy design at the urban scale
9. Case studies

ABSTRACTS

Deadline for abstracts	31 December 2005
Notification of acceptance	31 January 2006

FULL PAPERS

Deadline for full papers	31 March 2006
Notification of acceptance	15 May 2006
Deadline for final versions	15 June 2006
Definitive notification for oral or poster presentation	30 June 2006

"Urban Remote Sensing: Challenges & Solutions",
2-3 March 2006,
Berlin-Adlershof, Germany

This is the First Workshop of the EARSeL Special Interest Group on Urban Remote Sensing.

contact: Prof. Dr. Patrick Hostert,
patrick.hostert@geo.hu-berlin.de

The Fall Meeting of the AGU will be held on 5–9 Dec. 2005, in San Francisco.

Among the sessions are many that may be of interest to urban climatologists.

These include:

- B15: Hydrology, Ecology and Biogeochemistry of Suburbia
- B11: Changes in Land Use and Water Use and Their Effects on Climate,
- Including Biogeochemical Cycles
- H62: Integrated Approaches to Improve Understanding and Prediction of
- Hydrologic Response to Land Disturbance
- H16: Impacts of Land Use/Land Cover Change on the Water Cycle

The online submission deadline is Sept. 8. Further information can be obtained at http://www.agu.org/meetings/fm05/

Urban Data Management Meeting
UDMS 2006

May 15-17, 2006,
AALBORG, DENMARK

<http://www.udms.net/>

FIRST ANNOUNCEMENT &
CALL FOR PAPERS

UDMS, the Urban Data Management Society, has organised international symposia at various locations in Europe in order to promote the development of information systems in local government since 1971.

ICUC-6

ICUC-6
Sixth International
Conference on Urban Climate
Göteborg, Sweden
June 12th - 16th, 2006

The IAUC members have selected Göteborg (Gothenburg), Sweden as the site for the sixth International Conference on Urban Climate. Further details will become available at the conference website www.gvc.gu.se/icuc6, which is also accessible via the IAUC website (www.urban-climate.org).

Call for papers

ICUC-6 welcomes papers seeking to understand the nature of the atmosphere in urban environments or to the application of such knowledge to the better design and operation of settlements. Scales of interest range from individual built elements (roofs, walls, roads) through whole buildings, streets, factories, parks, clusters of buildings and neighborhoods, to whole cities and urban regions and their impacts on weather and climate at scales up to those of global change. The focus can be original research into the physical, biological and chemical atmospheric processes operating in built areas; the weather, climates and surface hydrology experienced in built areas; the design and testing of scale, statistical and numerical models of urban climates; or reports on the application of climatic understanding in architectural design or urban planning. Papers may relate to new concepts, methods, instruments, observations, applications, forecasting operations, scenario testing, projections of future climates, etc. Sessions that focus on major field studies or other projects or topics may be proposed. For further information please visit the website or email Professor Sven Lindqvist, chair of the local organizing committee (sven@gvc.gu.se) or Prof. Sue Grimmond (grimmon@indiana.edu), President IAUC.

The deadline for submission of abstracts is 10th November, 2005. Abstracts will be submitted via the web. Appropriate topics include, but are not restricted to:

- Airflow over cities, including turbulence, urban roughness and drag, changes of wind speed and direction, urban circulation systems, and wind engineering
- Anthropogenic Heat
- Building climates (interior and exterior) and the climatic performance of built features
- Carbon exchanges in urban areas
- Cities and global change
- Climate-sensitive urban design and planning
- Climates of paved surfaces such as roads, streets, highways, runways and parking lots
- Climatic performance of urban trees, lawns, gardens, parks, green roofs, irrigation, rivers, lakes and reservoirs
- Emergency response planning
- Exchanges of heat, mass and momentum between the urban surface and its boundary layer
- Forecasting urban weather, comfort, hazards, and air quality
- Interactions between urban climate and the emission, dispersion, transport, transformation and removal of air pollutants
- Models, and their evaluation, of the urban atmosphere at all scales and urban surface-atmosphere exchanges
- Remote sensing of cities and urban climate
- Road climatology in cities, including influence from traffic and other city related-objects
- Short- and long-wave radiation in polluted air and urban visibility
- Topoclimatology of cities, including the effects of coasts, valleys and other landforms
- Urban biometeorology relevant to the functioning of plants, wildlife and humans
- Urban climates in high latitude settings
- Urban heat islands, their nature, genesis and mitigation
- Urban impacts on surface moisture, dew, evaporation, humidity, fog, cloud and precipitation

Report
ICUC-6 Organization Committee

Online submission of abstracts is now available. Please visit (www.gvc.gu.se/icuc6).

Program changes:

- All **main authors** need to pay an abstract fee of 470 SEK.
- Additional abstracts submitted by the same main author will be free of charge.

IAUC Committee Reports

Bibliography

This has been a great year for urban climate publications. We have seen a wide range of interesting papers spanning the breadth of the subject from cities around the world. Thanks to everyone who has collected and sent in references. Look out for the complete 2003 and 2004 bibliographies on the IAUC website in the near future!

Please send any further papers published since January 1 2004 for inclusion in the next newsletter to j.salmond@bham.ac.uk. As before, please mark the header of your email with 'IAUC Publications 2004'. In order to facilitate entering the information into the data base please use the following format:

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

We look forward to hearing from you soon!

Jennifer Salmond
University of Birmingham
j.salmond@bham.ac.uk

Recent publications in Urban Climatology
(Languages are specified where the publication is known to be in a language other than in English.)

1. Abdul-Wahab, S.A., Bakheit, C.S. and Siddiqui, R.A. (2005). "Study the relationship between the health effects and characterization of thermal inversions in the Sultanate of Oman." Atmospheric Environment, **39** (30): 5466-5471.
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Board Information

1000th Member

The IAUC recently passed a milestone when Rajiv Ganguly became the 1000th member of the organization.

Rajiv is a native of Kolkata in India. He completed his Bachelor of Engineering in Civil Engineering in the year 2000 and Master of Civil Engineering specializing in Environmental Engineering in 2003. Thereafter, he was a research student at Indian Institute of Technology-Guwahati for almost two years.

He is currently a research student at Trinity College Dublin, Ireland and is working on modelling the dispersion of air pollutants from urban transport. He has done previous work on CNG and its viability as an alternative fuel to diesel and gasoline and its suitability. In this context he is interested in understanding the global impact of the urban climate and its management.

Board Members & Terms

President: Sue Grimmond (USA), 2007
Secretary: Matthias Roth (Singapore), 2007
Janet Barlow (UK), 2007
Arieh Bitan (Israel), 2006
Jennifer Salmond (UK), 2009.
Krzysztof Fortuniak (Poland), 2007
Wilhelm Kuttler (Germany), 2008
Gerald Mills (Ireland), 2007
Manabu Kanda (Japan), 2009
James Voogt (Canada), 2006

Non-Voting members of the Board:
Past Secretary: John Arnfield, USA.
Past President: Tim Oke, Canada.
Local Organizer ICUC5: Kazimierz Klysik Poland.
Local Organizer ICUC6: Sven Lindqvist, Sweden.

IAUC 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: James Voogt

In order to extend the pool of candidates for President and Secretary of the IAUC the Board decided that past Board members should also be eligible to stand for office. The following changes (in bold) to the *IAUC Board Procedures and Terms* were therefore adopted (click on *Board Actions* on www.urban-climate.org for full text):

C. The Board Executive

1. The President is elected by the Board from current **or past** elected Board members, two years in advance of the date of taking office. If elected at a Board meeting the vote is by a show of hands with the candidates excluded from the room. **If a Board member is unable to attend the vote can be forwarded by e-mail to the Secretary.** Election may also be by e-mail, run by the Secretary. The President-Elect remains on the Board until his/her term as President begins, however long he/she has been on the Board. **If a past member is elected she/he will rejoin the Board for the two years prior to installation to ensure continuity of business.**

2. The Secretary is elected by the Board from current **or past** elected Board members two years in advance of the date of taking office. If elected at a Board meeting the vote is by a show of hands with the candidates excluded from the room. **If a Board member is unable to attend the vote can be forwarded by e-mail to the President.** Election may also be by e-mail, run by the President. The Secretary-Elect remains on the Board until his/her term as Secretary begins, however long he/she has been on the Board. **If a past member is elected she/he will rejoin the Board for the two years prior to installation to ensure continuity of business.**

The terms of the current President and Secretary will end in 2007. According to the *Board Procedures and Terms* the new President and Secretary are elected two years in advance of the date taking office. We will therefore soon be appointing the next President-elect and Secretary-elect.

Matthias Roth
Secretary IAUC
(geomr@nus.edu.sg)