





### **UN Programme on Space Applications:**

### **UN Basic Space Science Initiative**

**UN/BSS Science Organizing Committee Planning Meeting** 

Goddard Space Flight Center Greenbelt MD, USA 19-21 October 2004 http://ihy.gsfc.nasa.gov/events/unbss.shtml

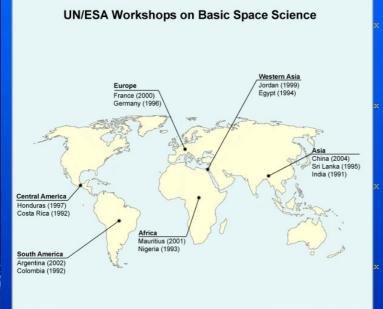






#### **Regional or International**

#### UN/ESA Workshops on Basic Space Science:



Map BSS-04-01 Rev.1 October 2004 Office for Outer Space Affairs (UN-OOSA) United Nations



**Regional:** 

India, Costa Rica, Colombia, Nigeria, Egypt

Inauguration of Optical Telescopes: Sri Lanka, Honduras, Jordan

International: Germany, France, Mauritius, Argentina

Review of all Workshops: China







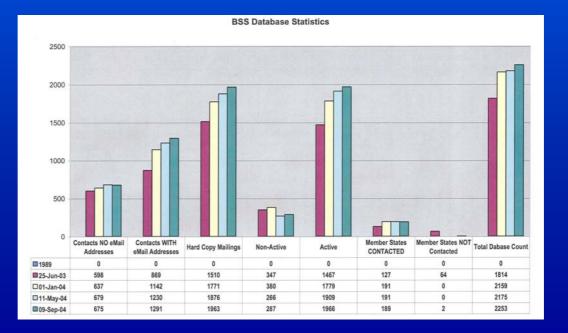


#### Workshops⇒ Networks⇒ Expert Meetings⇒ Projects

- Workshops Database
  - 191 United Nations Member States
  - **1,291 contacts by email**
  - 675 contacts by snail-mail

#### Total: 1,966 contacts around the world

#### Information disseminated on a regular basis



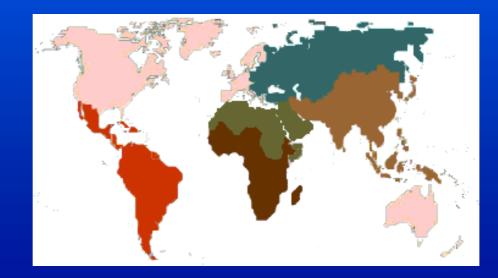






### Workshops⇒ Networks⇒ Expert Meetings⇒Projects

- United Nations Development Programme (UNDP) Offices
  - UNDP cooperates with governments and peoples, largely in developing countries
    - 166 offices worldwide
    - 100 offices accessible through WWW
  - Information disseminated annually to invite applications for workshops



#### **UNDP** Regional groupings







# International Expert Meetings in Conjunction with UN/ESA Workshops

Near-Earth Objects: The United Nations Conference
 UN Headquarters, New York, 1995



- Observing programmes for small telescopes
- Threat to planet Earth
- UNISPACE III: Action Team 14
  - 3-year work plan at STSC

6<sup>th</sup> International Space Cooperation Workshop: Addressing Challenges of the New Millennium

AIAA, Spain, 2001







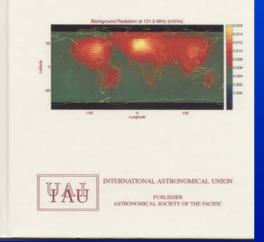
# International Expert Meetings in Conjunction with UN/ESA Workshops

#### Preserving the Astronomical Sky: IAU Symposium 196 UNISPACE III, Vienna, 1999

INTERNATIONAL ASTRONOMICAL UNION SYMPOSIUM NO. 196

#### PRESERVING THE ASTRONOMICAL SKY

Edited by: R. J. COHEN and W. T. SULLIVAN, III



Adverse environmental impacts on astronomy by light pollution, radio noise

#### STSC: IAU observer

- D. McNally
- J. Andersen

#### UNISPACE III: LSC?

International Dark-Sky Association







# International Expert Meetings in Conjunction with UN/ESA Workshops

 Data Processing from the Chanrda and XMM-Newton Space Missions

COSPAR, Brazil 2001, Indian 2003, South Africa 2004 at Regional Centres affiliated to the UN









- Government of Japan:
  - Japanese Cultural Grant Aid
     45cm reflecting telescope
  - CCD & computer equipment
  - Building/ dome/ maintenance provided by local institution
  - Sri Lanka 1996, Paraguay 2000, The Philippines 2001, Chile 2003, Nigeria 2004
  - Bolivia, Pakistan, Ethiopia



Sri Lanka 1996

#### American Association of Variable Star Observers (AAVSO):

- Hands-on Astrophysics
- Setting Up a Variable Star Observing Programme









- International Astronomical Union (IAU):
  - Astrophysics for University Physics Courses
    - Study/ comparison of university education curricula in developing countries
    - Elementary calculus
    - Classical mechanics
    - Statistical mechanics
    - \* Thermodynamics applied to astronomy
    - \* Advanced teaching material recommended:
    - K.R. LANG / J. BENNET et al.









#### CCD photometry of KZ Hya using the 45-cm telescope in Paraguay

Fredy Doncel, Alexis Troche and Takeshi Noguchi

Universidad Nacional de Asuncion Facultad Politécnica Observatorio Astronómico

#### Abstract

A SX Phe-type pulsating variable KZ Hya (HD94033) was observed with CCD set attached to the 45-cm reflector at Asuncion Astronomical Observatory in Paraguay. In the present work, 12 maximum phases were covered. A new ephemeris has been obtained, and the result suggests a probable change of the pulsation period of KZ Hya.

#### 1. Introduction

CCD photometric observations of KZ Hya ( $\alpha$ =10<sup>h</sup>51<sup>m</sup>54.08<sup>s</sup>, 5=-25<sup>deg</sup>21<sup>m</sup>10.8<sup>s</sup>, 2000 ) were made during 7 nights from April 18 to July 17, 2002, with the 45-cm reflector ( made by Goto ) at Asuncion Astronomical Observatory ( Longitude=57<sup>deg</sup>31<sup>m</sup>27<sup>s</sup>W, Latitude=-25.<sup>deg</sup>20<sup>m</sup>16<sup>s</sup>, h=25m ) in Paraguay. KZ Hya was first discovered in 1975 by Przybylski and Bessell (1979 ) in photometric survey of early type stars with high proper motion, and was the first known short period cepheid which clearly belongs to Population II

A photograph of the 45-cm telescope is shown in Figure 1, and the Observatory building with sliding roof is shown in Figure 2.





Figure 1. The 45-cm telescope at Asuncion Observatory.

Figure 2. The Observatory building with a sliding roof.

1







UNITED NATIONS



VEREINTE NATIONEN Informationsdienst

For information - not an official document Zur Information - kein officielles Dokument Pour information - document sans caractère officiel

UNIS/OS/224 6 February 2001

#### Japan's Contribution to UN Programmes of Promoting Astronomy and Basic Space Science in Developing Countries Marks Tenth Year Anniversary

VIENNA, 6 February (UN Information Service) - Cooperation between Japan and the United Nations in promoting space science programmes in developing countries is marking its tenth year in 2001. Representatives of Japan are expected to receive a special word of praise for the decade long, model-like cooperation during the next session of the Scientific and Technical Subcommittee of the UN's Committee on the Peaceful Uses of Outer Space which begins here on 12 February.

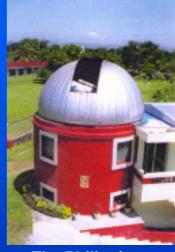
Building on the successes of the past ten years, the Government of Japan, in cooperation with the Vienna-based United Nations Office for Outer Space Affairs, is continuing the establishment of Planetaria and astronomical telescope facilities at universities in developing nations. Japan's initiative is facilitated through Japan's Cultural Grant Aid and General Grant Aid Programmes. Cooperation between leading astronomers from the National Astronomical Observatory of Japan, Tokyo, with their peers in developing countries has been a main driving force for establishing Planetaria and astronomical telescope facilities in developing nations around the world.

Planetaria have been donated to Uzbekistan (2000), India (1999), Sri Lanka (1998), Uruguay (1994), Argentina (1993). Currently negotiations are on-going between the Governments of Costa Rica and Japan to establish a Planetarium at the Universidad de Costa Rica in San Jose.

Astronomical telescopes and supplementary equipment has also been provided by Japan to the Philippines (2000), Paraguay (1999), Sri Lanka (1995). The Government of Chile is currently negotiating with the Government of Japan the establishment of an astronomical telescope facility at the Cerro Calan Astronomical Observatory at the University of Chile.

These developments follow up on recommendations made at a series of basic space science workshops organized annually since 1991 under the United Nations Programme on Space Applications, implemented by the Office for Outer Space Affairs in cooperation with the European Space Agency

Visit our homepage: http://www.unis.unvienna.org



The Philippines



Chile

VIENNA INTERNATIONAL CENTRE, P.O.BOX 500, A-1400 VIENNA, AUSTRIA TEL.: (43-1) 26060-4666 FAX: -5899 E-MAIL: UNIS@unvienna.org







#### **Proceedings of the Workshops: Research Papers**

#### AIP Conference Proceedings Series

- x India 1991
  - Nigeria 1993



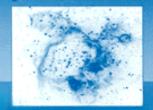
Concepts, Mathematics, Physics, and Application International Spring School Texel, The Netherlands 2000





MERCAN <u>PHYSICS</u> AIP CONFERENCE PROCEEDINGS # 54

#### Astrophysics and Space Science



Editors, John Oyson and William Warnalaker

Naveland Flores GALACE EXCLOSION Charle Tablea M. SPITE

Kluwer Academic Publishers

#### Astrophysics and Space Science

- Columbia 1992
- **Egypt 1994**
- Germany 1996
- x Jordan 1999
- x Mauritius 2001
- x Argentina 2002
- **China 2004**

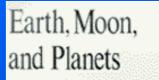






#### **Proceedings of the Workshops: Research Papers**

- Earth, Moon, and Planets
  - x Costa Rica 1992
  - Egypt 1994



An International Journal of Solar System Science



Elover Academic Publishers Dorbecht / Bostan / London





## Seminars of the UN Programme on Space Applications

- Selected Papers from Activities held in 1991-2004
- Project Proposals, Project Reviews, Country Profiles



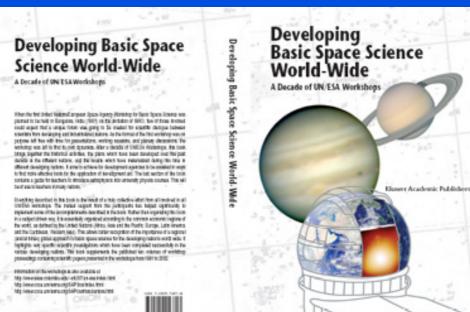




#### **Proceedings of the Workshops: Research Papers**

## Developing Basic Space Science World-Wide: A Decade of UN/ESA Workshops

- x 40 projects
  - 70 scientists and engineers
  - Regionally and internationally



NAW WEAF AL







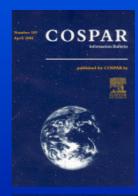
#### **Short Reports Annually**

- American Astronomical Society
  - **workshop announcements**
  - Workshop reports
  - **\*** Regional Centres
  - Support from international astronomical community (AAS)



#### **COSPAR Information Bulletin**

Space Policy



Space Policy







#### **United Nations General Assembly Documents**

- Reports on UN/ESA Workshops
  - Document series: A/AC.105/\*\*\*
  - **x** Contains:
    - Background and objectives
    - Programme
    - Attendance
    - **\*** Summary of Presentations
    - Observations and recommendations
    - Review of status of follow-up projects
    - Available in:
      - **x** Arabic
      - **x** Chinese
      - **x** English
      - **x** French
      - **x** Russian
      - x Spanish
  - Reports to COPUOS/STSC
  - Participants link with Governments

|          | United Nations  | Алс.10  | \$/766   |
|----------|---|---|--|
| ۲        | General Assembly Distr: General<br>4 December 2001<br>Original: English   |   |  |
|          |   |   |  |
|          | on the Peaceful<br>uter Space   |   |  |
|          | Report on the Tenth United Nations/European Space<br>Agency Workshop on Basic Space Science: Exploring the<br>Universe; Sky Surveys, Space Exploration and Space<br>Technologies  |   |  |
|          |   |   |  |
|          | (Reduit, Mauritius, 25-29 June 2001)  |   |  |
| Contents | (Reduit, Mauritius, 25-29 June 2001)  | Paragraphi  | Page   |
|          | (Reduit, Mauritius, 25-29 June 2001)  | Paragraphi<br>1–12  | Pape<br>2  |
|          | Introduction<br>A. Background and objectives  | 1-12<br>1-7   | 2  |
|          | Introduction A. Background and objectives B. Programme  | 1-12<br>1-7<br>8-9  | 2 2 2  |
| L        | Introduction A. Background and objectives D. Programme C. Attendance.   | 1-12<br>1-7<br>8-9<br>10-12   | 2 2 2 3  |
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| L        | Introduction A Background and objectives B Programme C Attendance Observations and recommendations A Space exploration B Sky surveys  | 1-12<br>1-7<br>8-9<br>10-12<br>13-32<br>15-18<br>19-20  | 2 2 2 3 3 3 3 3  |
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#### **Reports to the World Community (long reports)**

#### The Future of the Universe and the Future of Our Civilization

 UNESCO World Conference on Science Hungary 1999 (UNISPACE III, Austria, 1999)

#### The Future of the Universe and the Future of Our Civilization



Cattern V. Biorodyszchia G. Kihozelin

World Scientific



## Organizations and Strategies in Astronomy

\* Astrophysics and Space Science Library, Kluwer Academic Publishers, 2001







#### **Reports to the World Community (long reports)**

#### The Future of Small Telescopes in the New Millennium

Astrophysics and Space Science Library Kluwer Academic Publishers, 2003

ASTROPHYSICS AND SPACE SCIENCE LIBRARY

#### THE FUTURE OF SMALL TELESCOPES IN THE NEW MILLENNIUM

Volume I - Perceptions, Productivities, and Policies

#### Terry D. Oswalt (Editor)

An invaluable reference for any student, scientist or administrator, using small telescopes for research. An essential collection of data and opinions for those charged with setting scientific and funding priorities.

This three-colume set, *The Finance of Small Telescopes in the New Millerminor* details the essential robethan small telescopes should pluy in 21° entropy science and how their future productivity can be maximized. Over 70 expects from all corrences of the international astronomical community have erasted a definitive reference on the present and future of "the science with multi elescopes."

Despte highly phicked closers of thesespes smaller than 4-m in preture a mational facilities and their omission from national science printry studes, the of-himered dennie of the small telescope has been grantly escapped. In fact, the fature of these workbases of autonomy will be brighter than ever if grantly escapped. In fact, the fature of these workbases of autonomy will be brighter than ever if grantly escapped. In fact, the fature of these workbases of autonomy will be brighter than ever if grantly escapped and the structure closers are structure from for the more the realized. A wide cross-section of the autonomical community has contributed to a definitive assessment of the present and a vision for the future.

#### Volume 1: Perceptions, Productivities and Polics

Beginning with a summary of recent rational scientific priority-setting efforts, Volume 1 examines the public's and the astronomical community's own perceptions of and microcoeptions about small telescope productivity. These shape the future scientific research that will be done with telescope smaller than 4-m in aperture, and the random of astronomers that will have access to them.

#### Volume 2: The Telescopes We Use

Smult conterference opticals, realiss and space-based facilities face annual problems in scientific prioritization and funding. Volume 2 highlights how current smull facilities are evolving to meet the scientific priorities and communical realities of the 21 ecrumy through standardization of instanaentation, use of off-bioshelf facilitationg, specialization, optical improvements, new modes of scheduling, automation, and internet access.

#### Volume 3: Science in the Shadow of Giants

What first-rank science can small telescopes contribute in the coming era of 30-m class guint telescopes? Volume 3 explores a broad selection of scientific initiatives, from planetary astronomy to cosmology, that are ideally solved for small telescopes.

The Future of Smill Telescopes in the New Milleminue is a fundamental resource for those looking to undertake new projects with small telescopes, for those that are tesponable for their operation, and for those called upon to help set scientific priorities for the coming decade. It will be useful for the practicing researcher, mountain facility imager, science policy maker, and beginning graduate subsett.



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#### THE FUTURE OF SMALL TELESCOPES IN THE NEW MILLENNIUM

Volume I – Perceptions, Productivities,

and Policies

Terry D. Oswalt (editor)

KLUWER ACADEMIC PUBLISHERS

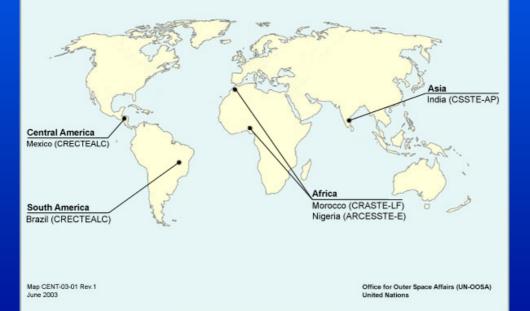






### **Regional Centres for Space Science and Technology Education, Affiliated to the United Nations**

Regional Centres for Space Science and Technology Education (affiliated to the United Nations)



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#### Website: http://www.oosa.unvienna.org/SAP/centres/centres.html



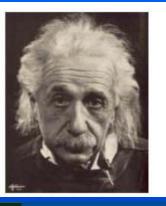


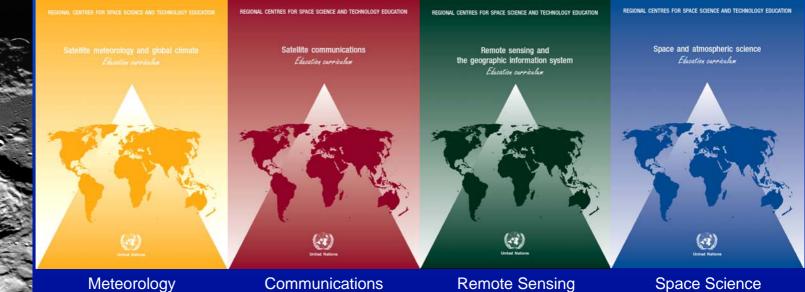


### **Regional Centres for Space Science and Technology Education, Affiliated to the United Nations**



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**Regional Centre Education Curricula** 







### **Co-organizers of the UN/ESA Workshops**



Austrian Space Agency



**Committee on Space** Research



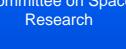
French Space Agency



German Space Agency



Institute of Space and **Astronautical Science** 





International Astronomical Union International Centre for **Theoretical Physics** 

#### **The Planetary Society**





National Aeronautics and **Space Administration** 



**United Nations** 



Wamsteker

**Kitamura** 



**European Space** Agency







### Letters of Exchange (Memorandum of Understanding)

- Entered into by the United Nations and the Workshop host country
  - Signed by representatives of the UN Secretary-General and President/Prime Minister
    - The United Nations
    - Language and Participation (six official languages)
    - The Government
    - Privileges and Immunities



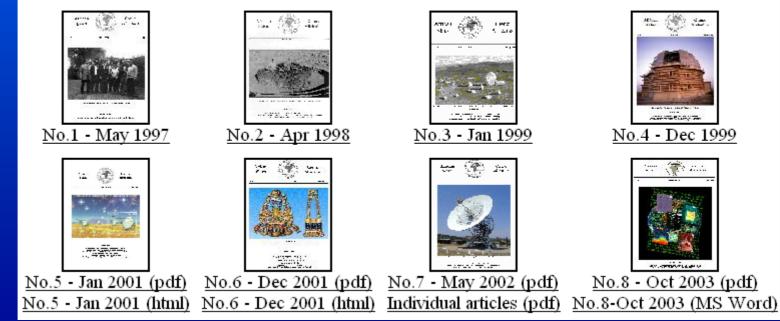




### The Working Group on Space Sciences in Africa



#### Back Issues of African Skies/Cieux Africains

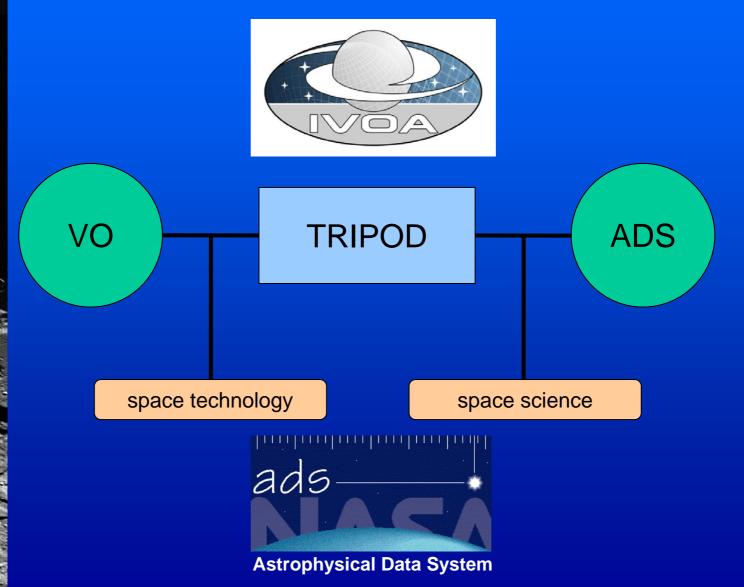








#### **International Virtual Observatory Alliance**









### **Concurrent Design Capability for the Development of International Space Missions**

- France 2000
- Argentina 2002
- **China 2004**









### **Space Science: Theoretical Astrophysics**

 $\frac{\partial J}{\partial \rho_i} = 0$ 

#### Non-extensive Statistical Mechanics



B.G. Statistics - A reminder.

 $S = -k \sum \rho_i \ln \rho_i$ 

 $1 = \sum \rho$ 

 $U = \sum \rho_i \epsilon$ 

 $J = -k \sum \rho_i \ln \rho_i + \sum \rho_i + \beta \sum \rho_i \epsilon_i$ 

 $\rho_{\rm i} = \frac{{\rm e}^{-\beta\epsilon_{\rm i}}}{Z}$  where  $Z = \sum {\rm e}^{-\beta\epsilon_{\rm i}}$ 

• Entropy:

• Constraints:

• Maximize the objective:

• Yields distribution:



#### Postulate: [C. Tsallis J. Stat. Phys. 52 p479 (1988)]

#### Generalized entropy:

$$S_{q} = k \frac{1 - \sum_{i} \rho_{i}^{q}}{q - 1} \qquad q \in \mathfrak{P}$$

where q characterizes the extensivity of the statistics. Note: For q=1 regular B.G. Statistics is recovered:

 $S_{q \rightarrow l} \rightarrow -k \sum_i \rho_i \ln \rho_i$ 







### World Space Observatory Ultra Violet

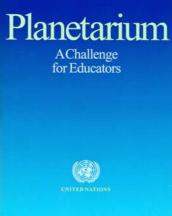








### **International Space Year (ISY) 1992**



Peru 2003



Myanmar 1986



UN Office for Outer Space Affairs Permanent Mission of "host country"

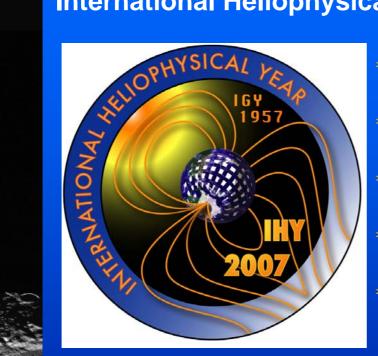
Viet Nam 1998







### International Heliophysical Year (ISY) 2007



- Putting the "I" in I\*Y
- > 66,000 scientists and engineers
- >> 60 countries (developing nations!)
- UNBSSI 2004-2008
- $WS \Rightarrow NW \Rightarrow EM \Rightarrow P$ ?