Office for Outer Space Affairs
United Nations Office at Vienna

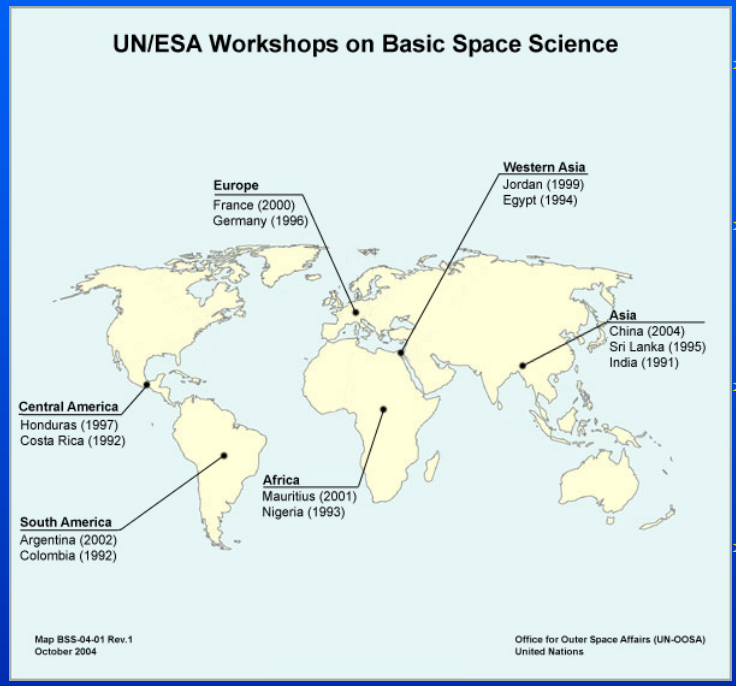
# UN Programme on Space Applications:

# 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:**




- **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


Mauritius 2001

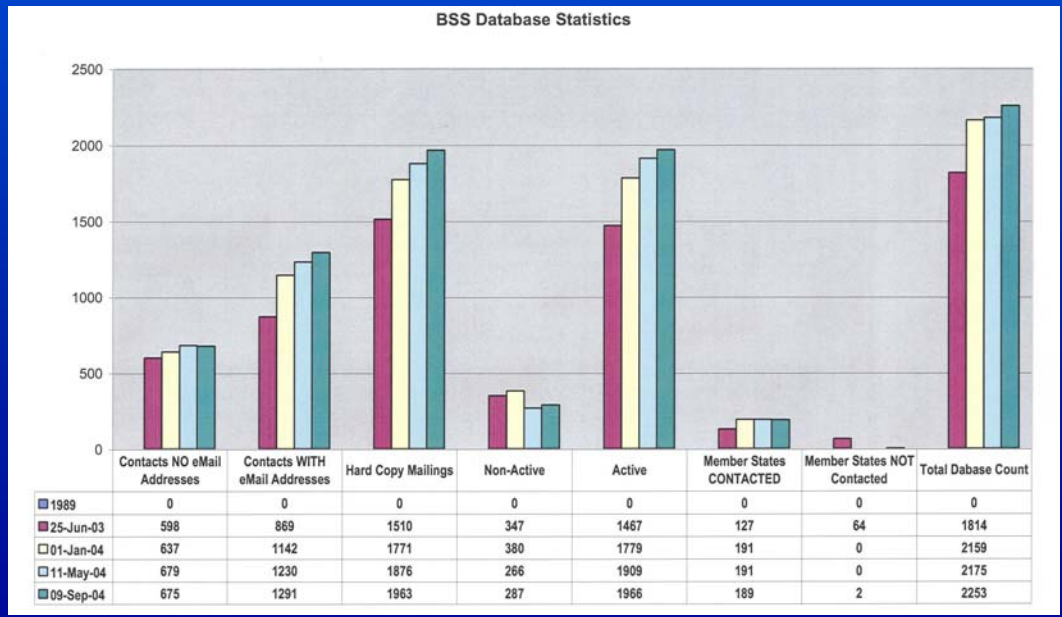

Argentina 2002

# 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**

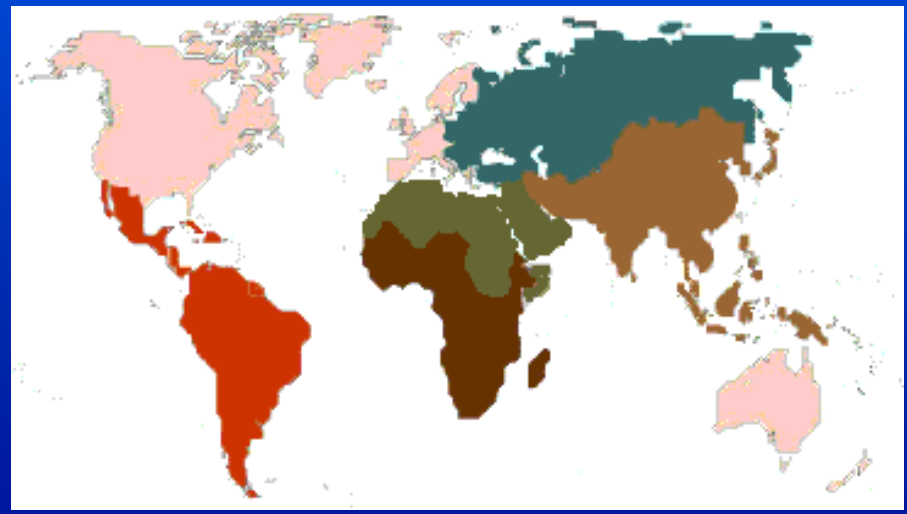
**Information disseminated on a regular basis**




| | Contacts NO eMail Addresses | Contacts WITH eMail Addresses | Hard Copy Mailings | Non-Active | Active | Member States CONTACTED | Member States NOT Contacted | Total Dabase Count |
|---|---|---|---|---|---|---|---|---|
| 1989 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 25-Jun-03 | 598 | 869 | 1510 | 347 | 1467 | 127 | 64 | 1814 |
| 01-Jan-04 | 637 | 1142 | 1771 | 380 | 1779 | 191 | 0 | 2159 |
| 11-May-04 | 679 | 1230 | 1876 | 266 | 1909 | 191 | 0 | 2175 |
| 09-Sep-04 | 675 | 1291 | 1963 | 287 | 1966 | 189 | 2 | 2253 |

# 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

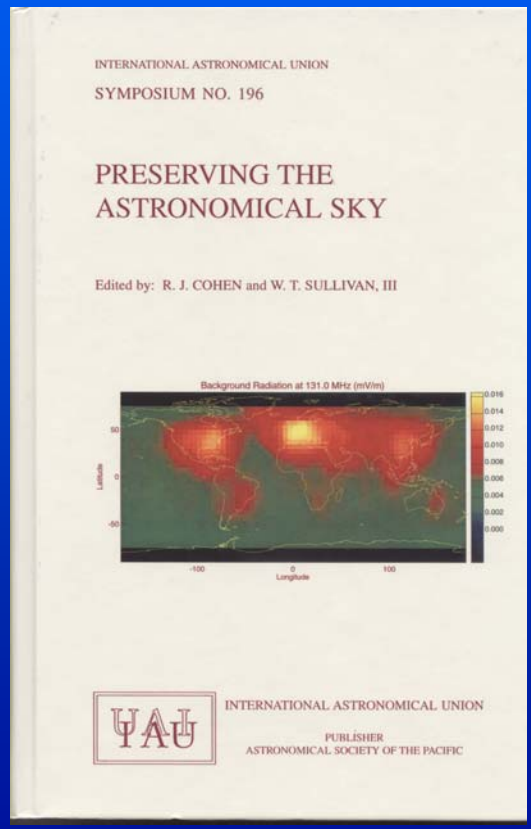
- **Near-Earth Objects: The United Nations Conference**
  UN Headquarters, New York, 1995


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

- **6th 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




- **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

# Project TRIPOD: Telescope, Teaching Observing

- **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

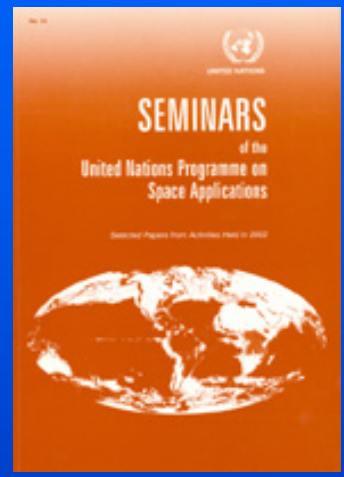
**Sri Lanka 1996**

- **American Association of Variable Star Observers (AAVSO):**
  - **Hands-on Astrophysics**
  - **Setting Up a Variable Star Observing Programme**

**Telescope ⇒ Observing ⇒ Teaching ⇒ Data Analysis ⇒ Data Transfer ⇒ Telescope Networking**

# Project TRIPOD: Telescope, Teaching Observing

- **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.



# Project TRIPOD: Telescope, Teaching Observing

## 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 ($\alpha=10^h51^m54.08^s$, $\delta=-25^{deg}21^m10.8^s$, 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=$57^{deg}31^m27^sW$, Latitude=$-25.^{deg}20^m16^s$, 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.

# Project TRIPOD: Telescope, Teaching Observing

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For information - not an official document  Zur Information - kein offizielles 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

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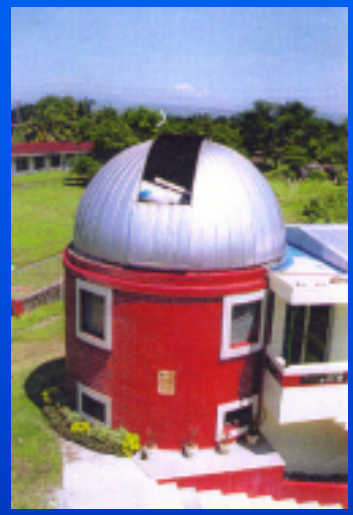
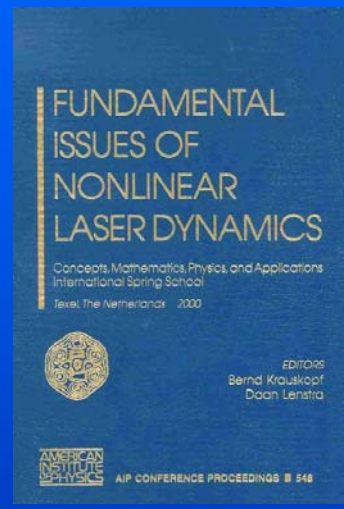


**The Philippines**

**Chile**

# Proceedings of the Workshops: Research Papers

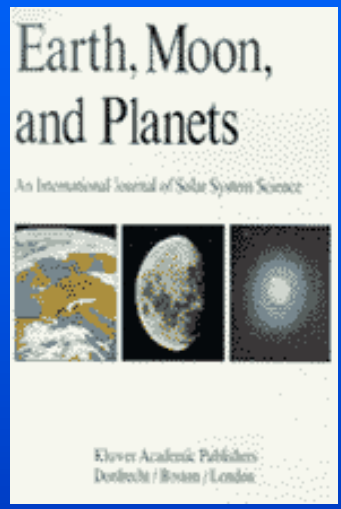
- **AIP Conference Proceedings Series**
  - India 1991
  - Nigeria 1993




- **Astrophysics and Space Science**
  - Columbia 1992
  - Egypt 1994
  - Germany 1996
  - Jordan 1999
  - Mauritius 2001
  - Argentina 2002
  - China 2004

# Proceedings of the Workshops: Research Papers

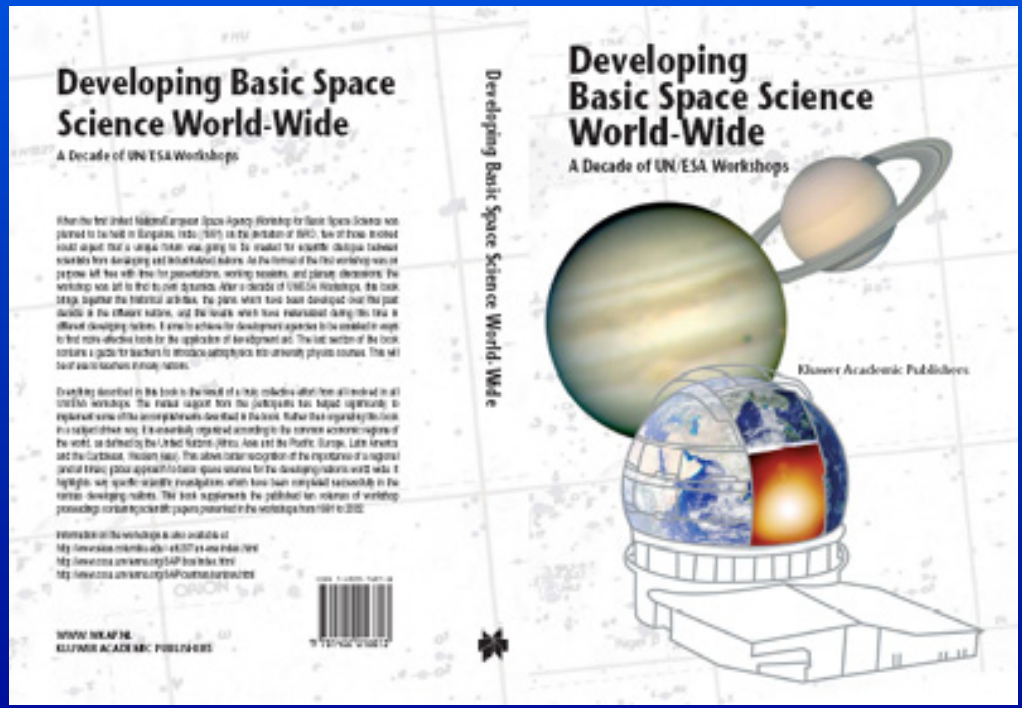
- **Earth, Moon, and Planets**
  - Costa Rica 1992
  - Egypt 1994




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



# Short Reports Annually

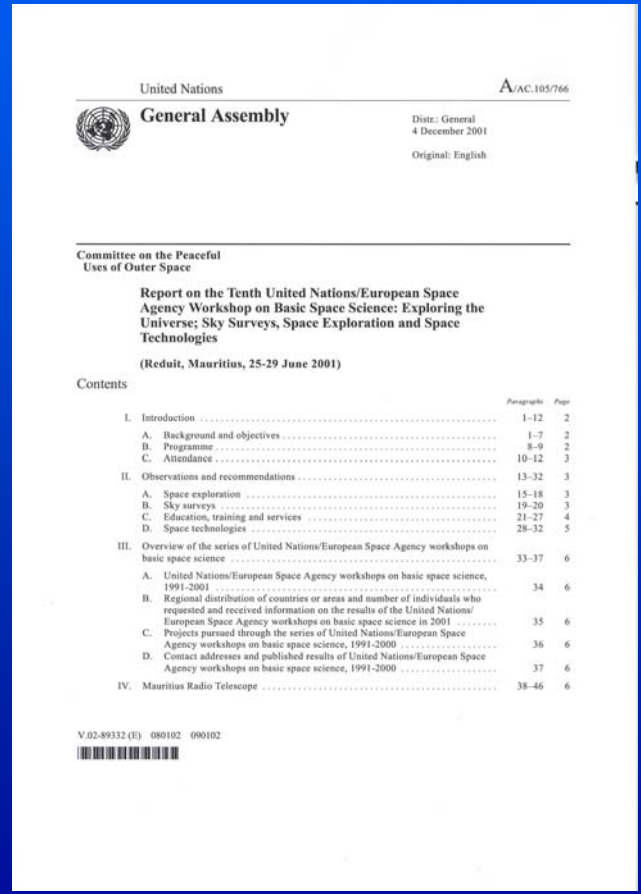
- **American Astronomical Society**
  - Workshop announcements
  - Workshop reports
  - Regional Centres
  - Support from international astronomical community (AAS)


- **COSPAR Information Bulletin**


- **Space Policy**

# United Nations General Assembly Documents

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



United Nations A/AC.105/766

General Assembly

Distr.: General
4 December 2001

Original: English

Committee on the Peaceful Uses of Outer Space

**Report on the Tenth United Nations/European Space Agency Workshop on Basic Space Science: Exploring the Universe; Sky Surveys, Space Exploration and Space Technologies**

**(Reduit, Mauritius, 25-29 June 2001)**

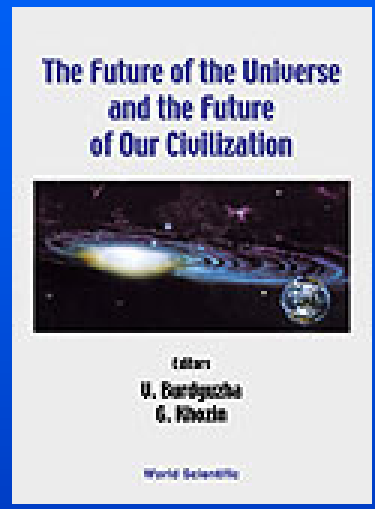
Contents



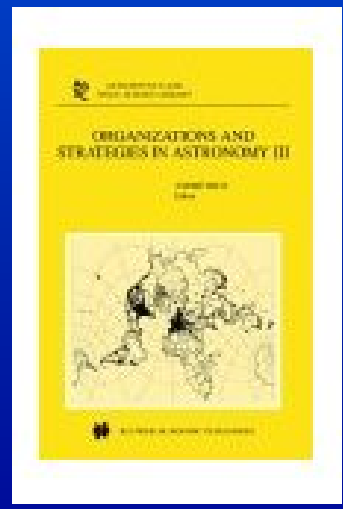
V.02-89332 (E) 080102 090102

# 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)

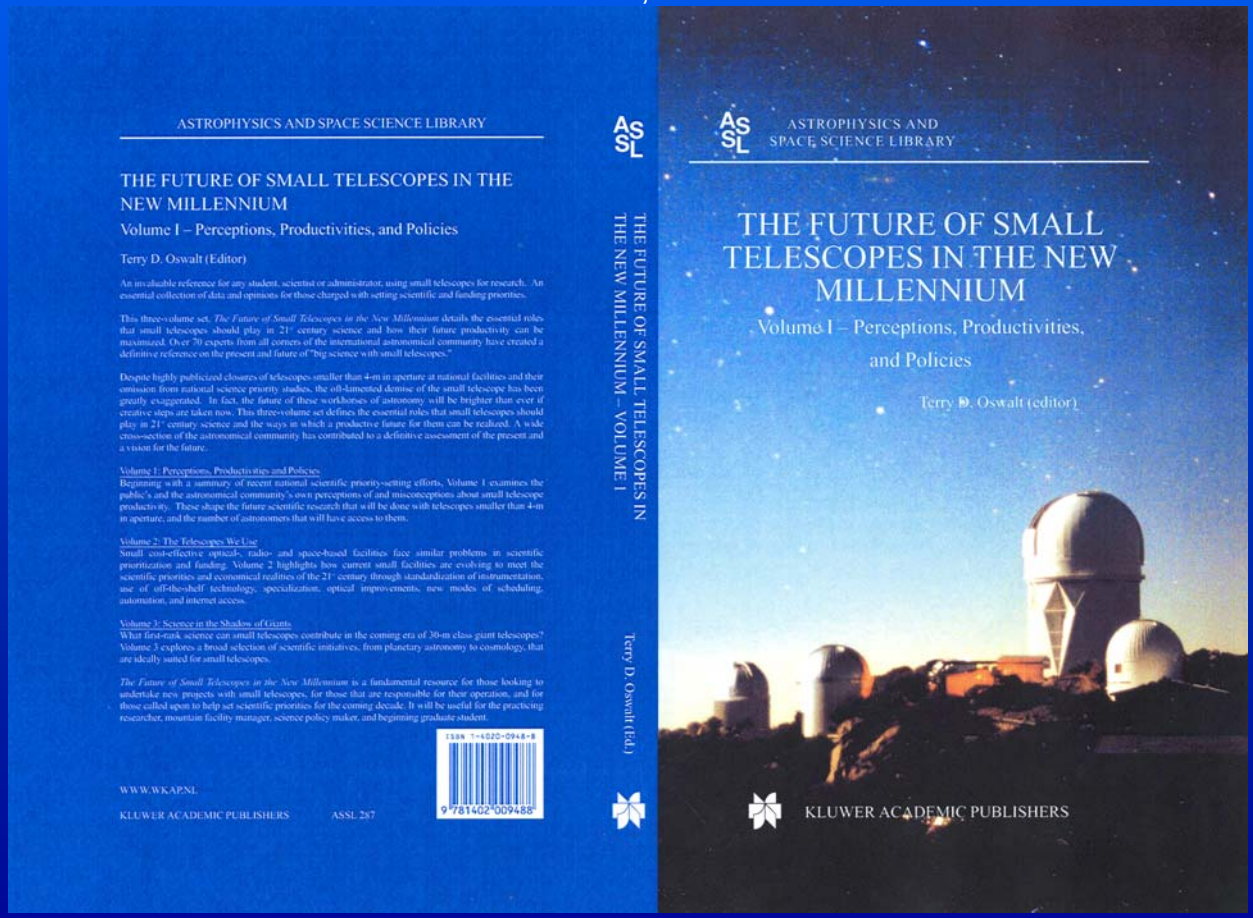



- **Organizations and Strategies in Astronomy**
  - **Astrophysics and Space Science Library,**
    Kluwer Academic Publishers, 2001

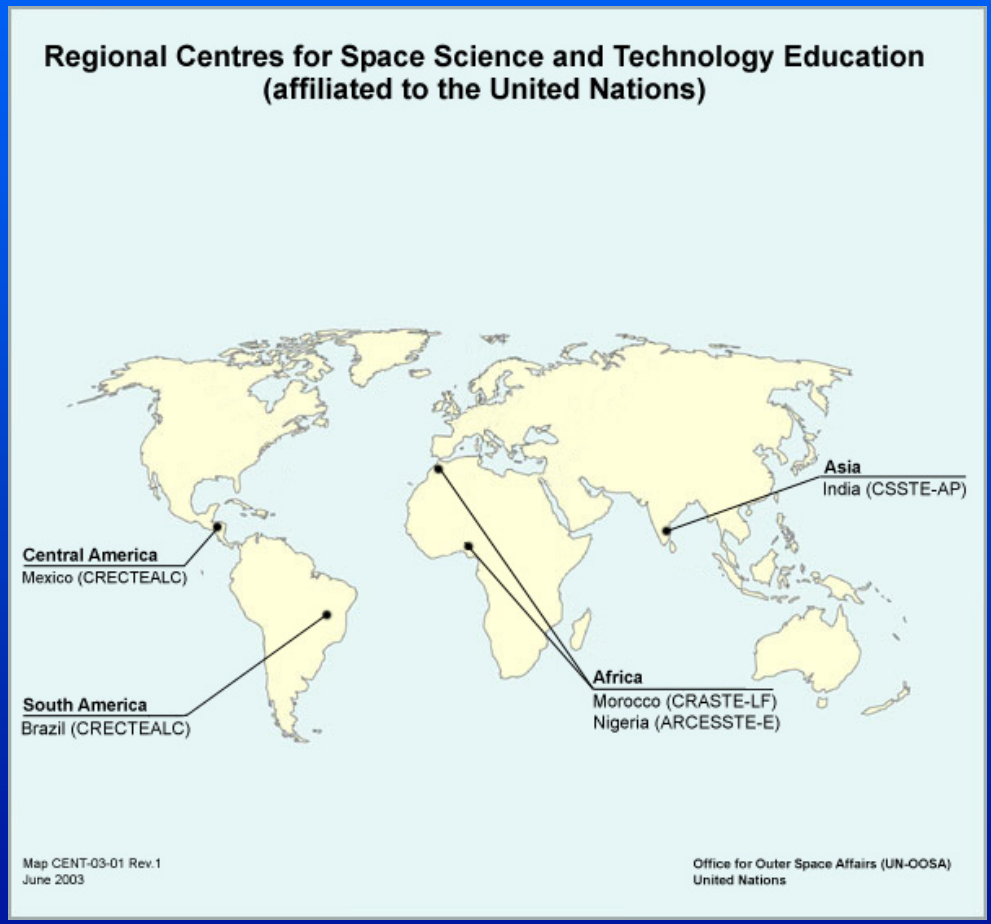


# Reports to the World Community (long reports)

- **The Future of Small Telescopes in the New Millennium**
  - **Astrophysics and Space Science Library**
    Kluwer Academic Publishers, 2003



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



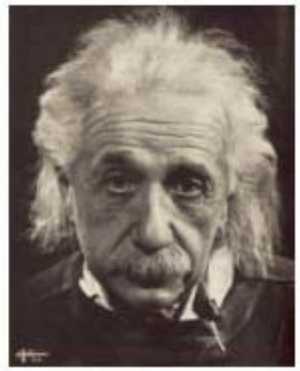


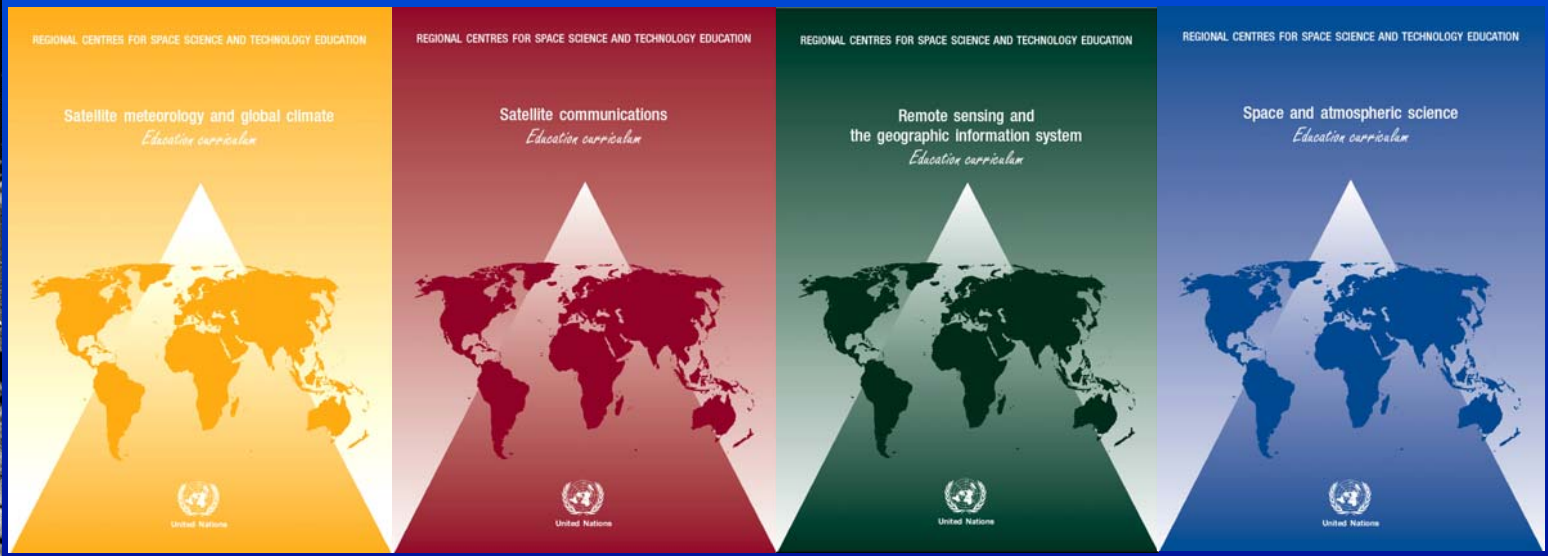
Education material

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

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

$$ds^2 = -\left(1+\frac{2\Phi}{c^2}\right)(c\ dt')^2 + \left(1-\frac{2\Phi}{c^2}\right)(dx^2+dy^2+dz^2)$$






Meteorology | Communications | Remote Sensing | Space Science

**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

National Aeronautics and Space Administration

**The Planetary Society**

United Nations


Wamsteker


Kitamura

European Space Agency

# Letters of Exchange (Memorandum of Understanding)

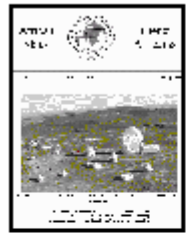
- **Entered into by the United Nations and the Workshop host country**
- **Signed by representatives of the UN Secretary-General and President/Prime Minister**
  - The United Nations
  - Language and Participation (six official languages)
  - The Government
  - Privileges and Immunities

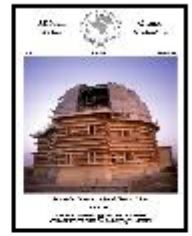
# The Working Group on Space Sciences in Africa

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


No.1 - May 1997

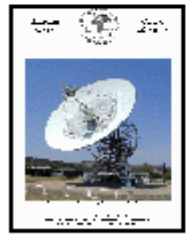

No.2 - Apr 1998

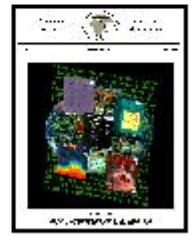

No.3 - Jan 1999


No.4 - Dec 1999


No.5 - Jan 2001 (pdf)
No.5 - Jan 2001 (html)


No.6 - Dec 2001 (pdf)
No.6 - Dec 2001 (html)


No.7 - May 2002 (pdf)
Individual articles (pdf)


No.8 - Oct 2003 (pdf)
No.8-Oct 2003 (MS Word)

# International Virtual Observatory Alliance

IVOA

VO

TRIPOD

ADS

space technology

space science

ads

Astrophysical Data System



# Concurrent Design Capability for the Development of International Space Missions

- France 2000
- Argentina 2002
- China 2004

# Space Science: Theoretical Astrophysics

- **Non-extensive Statistical Mechanics**

## B.G. Statistics - A reminder.

- Entropy: $S = -k\sum_i \rho_i \ln \rho_i$
- Constraints: $\begin{cases} 1 = \sum_i \rho_i \\ U = \sum_i \rho_i \epsilon_i \end{cases}$

- Maximize the objective: $J = -k\sum_i \rho_i \ln \rho_i + \sum_i \rho_i + \beta \sum_i \rho_i \epsilon_i \qquad \frac{\partial J}{\partial \rho_j} = 0$
- Yields distribution: $\rho_i = e^{-\beta \epsilon_i} / Z \qquad \text{where } Z = \sum_i e^{-\beta \epsilon_i}$

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

Generalized entropy:

$$S_q = k\frac{1-\sum_i \rho_i^q}{q-1} \qquad q \in \Re$$

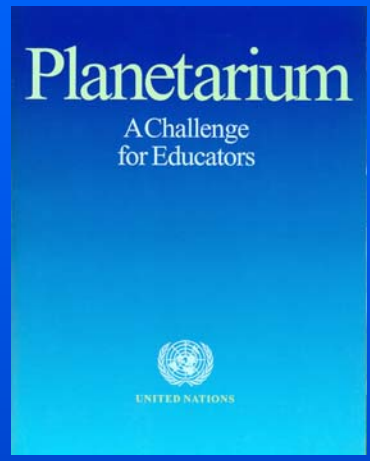
where q characterizes the extensivity of the statistics.

Note: For q=1 regular B.G. Statistics is recovered:

$$S_{q\to 1} \to -k\sum_i \rho_i \ln \rho_i$$

# World Space Observatory Ultra Violet

# International Space Year (ISY) 1992




Myanmar 1986

Peru 2003

Viet Nam 1998

- **UN Office for Outer Space Affairs**
- **Permanent Mission of “host country”**

# International Heliophysical Year (ISY) 2007


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