

# ISS09

INTERNATIONAL  
SCIENTIFIC  
STUDIES

## The International Scientific Studies Project (ISS)

- Global undertaking open to scientific experts and institutions around the world, which was launched in March 2008.
- Involves a series of independent scientific studies and assessments to address the readiness and capability of the Comprehensive Nuclear-Test-Ban Treaty (CTBT) to detect nuclear explosions worldwide.
- Focuses on the detection and location capabilities of the 337 facilities making up the CTBT's International Monitoring System (IMS).
- Addresses the ability of the IMS to characterize observed events.
- Evaluates the geological and radionuclide technologies and methods used for on-site inspection technologies.
- Explores the use of data, infrastructure and knowledge of the Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO) in support of scientific, humanitarian and other security related applications.



APPROACHING RADIONUCLIDE STATION RN73 IN ANTARCTICA.

### INTERNATIONAL SCIENTIFIC STUDIES CONFERENCE

HOFBURG IMPERIAL PALACE, VIENNA, AUSTRIA

10 TO 12 JUNE 2009

The results of the scientific studies carried out will be presented at the International Scientific Studies Conference – the ISS09 Conference – in Vienna, Austria.

The Conference will focus on issues related to the capability and readiness of the CTBT's verification regime to detect nuclear explosions worldwide. It will also address how the verification regime has benefitted from scientific and technical developments since the Treaty opened for signature in 1996.

### PARTICIPATION

Diplomats, officials, scientists, representatives from non-governmental organizations and the media are invited to attend the Conference.

If you are interested in contributing to any of the eight topic areas listed overleaf, please contact the project at: [iss@ctbto.org](mailto:iss@ctbto.org) or visit the ISS webpage at [www.ctbto.org](http://www.ctbto.org).



RADIONUCLIDE STATION RN33 NEAR FREIBURG, GERMANY.



OPERATION CENTRE AT THE INTERNATIONAL DATA CENTRE, VIENNA, AUSTRIA.

## 1. SYSTEM PERFORMANCE

The IMS is a complex global system comprising 337 monitoring facilities. The timeliness, quality and quantity of data which are produced, transmitted processed and distributed are essential elements to be evaluated.

COORDINATORS:  
 • PROF NICHOLAS KYRIAKOPOULOS, GEORGE WASHINGTON UNIVERSITY  
 • DR THIERRY HERITIER, FRENCH ATOMIC ENERGY COMMISSION

## 2. SEISMOLOGY

The work will concentrate on understanding and increasing the capabilities of the detection and location of seismic events globally, and on exploring how to use seismic information to more fully characterize events.

COORDINATORS:  
 • PROF ZHONGLIANG WU, CHINA EARTHQUAKE ADMINISTRATION  
 • PROF BARBARA ROMANOWICZ, UNIVERSITY OF BERKELEY

## 3. HYDROACOUSTICS

The hydroacoustic network comprises stations which detect both T and H phase signals\*. Detection and location capabilities of this network will be evaluated, as will the coverage. Information on the events detected by the network will be compiled. Synergies with seismic observations will be explored.

COORDINATORS:  
 • DR WOLFGANG JANS, FEDERAL ARMED FORCES RESEARCH INSTITUTE FOR UNDERWATER ACOUSTICS AND MARINE GEOPHYSICS  
 • PROF KIYOSHI SUYEHIRO, JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY

\* H PHASE REFERS TO A TYPE OF SOUND WAVE IN THE WATER THAT IS CREATED BY UNDERWATER EXPLOSIONS, WHILE T PHASE SIGNALS ARE CREATED WHEN A SEISMIC WAVE HITS THE WATER.

## 4. INFRASOUND

The infrasound network is unique and the full range of its capabilities is yet to be established. The studies have three main objectives: firstly, to make estimates of the detection and location capabilities of the network at regional and global distances; secondly, to explore ways to improve these capabilities; and thirdly, to enhance the understanding of observed events and propagation of acoustic waves through the atmosphere.

COORDINATORS:  
 • DR ELISABETH BLANC, FRENCH ATOMIC ENERGY COMMISSION  
 • DR LARS CERANNA, FEDERAL INSTITUTE FOR GEOSCIENCES AND NATURAL RESOURCES

## 5. RADIONUCLIDE OBSERVATIONS

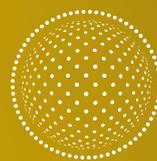
Both the particulate and the noble gas monitoring networks are unique on a global scale and their performance will be assessed thoroughly. This includes compiling information on frequently occurring anthropogenic radionuclides and on the natural background.

COORDINATORS:  
 • PROF WOLFGANG WEISS, BUNDESAMT FUER STRAHLENSCHUTZ  
 • DR HARRY MILEY, PACIFIC NORTHWEST NATIONAL LABORATORY

## 6. ATMOSPHERIC TRANSPORT MODELLING

Modelling and tracking the movement of air volumes is crucial for estimating the locations of sources of radionuclide particulates and noble gas observations. The aim of the studies is: to estimate the capabilities of present models and procedures, and to explore ways to further improve their accuracy .

COORDINATORS:  
 • DR RICHARD HOGUE, METEOROLOGICAL SERVICE CANADA  
 • DR PETER CHEN, WORLD METEOROLOGICAL ORGANIZATION



INSTALLATION OF INFRASOUND STATION IS18 AT QAANAQ, GREENLAND.



SETUP OF HYDROACOUSTIC STATION CABLE AT HA04, CROZET ISLAND, FRANCE.

## 7. ON-SITE INSPECTION

When conducting an on-site inspection (OSI), a number of geophysical techniques can be used. These techniques include passive, resonance and active seismic measurements as well as gravity, electric and magnetic field mappings. Noble gases such as Xenon and Argon will also be measured on-site. Argon-37 measurement is a unique technology. Data collected from various methods have to be fused and interpreted for decision making purposes. An important task is to explore how recent scientific and technical advances in these technologies can be applied to an OSI.

- COORDINATORS:
- DR MASSIMO CHIAPPINI, ISTITUTO NAZIONALE DI GEOFISICA VULCANOLOGIA
  - DR EDWARD IFFT, GEORGETOWN UNIVERSITY

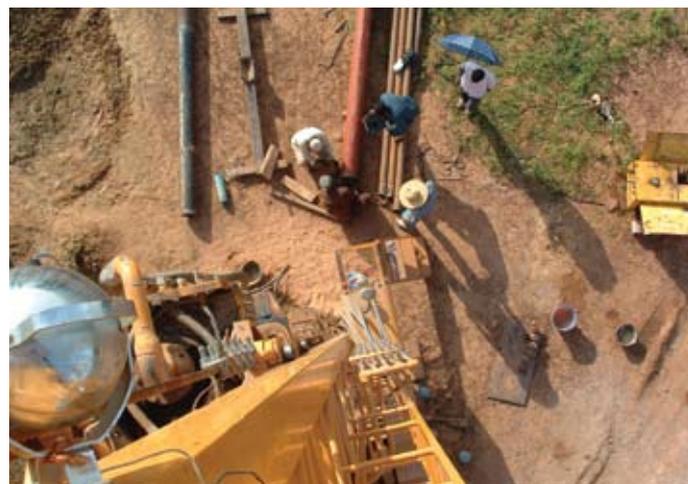
## 8. DATA MINING

The development of modern IT-based analysis methods – data mining – has been outstanding over the last decade. An important cross-cutting undertaking is to explore if and how such methods might be applied to the analysis of data in all stages of station and network processing as well as in event categorization and screening.

- COORDINATORS:
- DR SHEILA VAIDYA, LAWRENCE LIVERMORE NATIONAL LABORATORY
  - PROF ARNO SIEBES, UNIVERSITY OF UTRECHT

## DATA

The CTBTO has collected a large amount of data during the IMS's testing period that could be used in the studies. Appropriate data will be made available to participating institutions and experts on a case-by-case basis following established procedures.



INSTALLATION OF PRIMARY SEISMIC STATION PS26, TORODI, NIGER.



INSTALLATION OF COMMUNICATIONS EQUIPMENT FOR STATIONS AT TRISTAN DA CUNHA.

# FIRST ANNOUNCEMENT AND CALL FOR PAPERS

## SCOPE AND THEMES

The ISS09 Conference is being organized by the CTBTO and will consist of: **plenary sessions, keynote speaking sessions, panel discussion sessions, thematic presentation sessions, poster sessions and exhibitions.**

The Conference will address all aspects of the Treaty's verification regime and its ability to detect and locate observed events, including the IMS and the OSI regime.

## PROGRAMME SUMMARY

- Day 1: Overview of scientific developments since 1996 and their implications for the CTBT's capability.
- Day 2: In-depth discussions of contributed scientific studies.
- Day 3: Looking ahead in connecting the CTBTO with Science. Discussions will focus on how science can be applied to promote security, science and technology foresight, global capacity building, and scientific and civil applications of CTBT-related data and knowledge.

## CALL FOR PAPERS

**Scientific contributions** are invited on the eight topics areas listed on pages two and three. The **focus will be on the capabilities of detection, localization and characterization of CTBT relevant events and on scientific developments that can help improve these capabilities.** Contributions reflecting more general developments relevant to test ban verification from the listed topic areas are also welcome. Contributions are accepted on: recently conducted studies, reviews of results obtained over the last ten years, and earlier published papers that show results important for assessing the capability of the verification regime and scientific developments.

## ABSTRACT FORMAT

Authors are invited to submit contributions as one page abstracts and complete a registration form electronically, sending it to [iss@ctbto.org](mailto:iss@ctbto.org). The Call for Papers, Instructions and Template for submission of abstracts and registration forms can be downloaded from the CTBTO's web site: [www.ctbto.org](http://www.ctbto.org).

## SCHEDULE OF THE CALL FOR PAPERS

**31 March 2009:** deadline for abstract submission  
**30 April 2009:** notification of acceptance

## REGISTRATION

Participants are encouraged to register by **15 May 2009. No registration fee is charged.** Limited funds are available on request to help meet the cost of attendance. Requests for funds should be submitted by **31 March 2009.**

## LANGUAGE

The official language of the Conference is English.

## ACCEPTED ABSTRACTS

Authors of accepted abstracts will be requested to make their full papers and posters available at the Conference. The scientific papers will be published in scientific journals according to the praxis of the individual journals. Presentations made at the Conference will be summarized in a special publication that will also include a compilation of the one page abstracts in the form of an annex.

## MORE INFORMATION

Further information on the ISS09 Conference, including a preliminary agenda, hotel accommodation details and other administrative information, will be available at the CTBTO's web site at: [www.ctbto.org](http://www.ctbto.org).

### ISS09 CONFERENCE CONTACTS:

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of the Preparatory Commission for the CTBTO  
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