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INTERNATIONAL INSTITUTE OF THEORETICAL AND APPLIED PHYSICS AND THE WHOLE EARTH TELESCOPE

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Abstract. In partnership with the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Iowa State University (ISU) formed the International Institute of Theoretical and Applied Physics (IITAP). The mission of IITAP is to foster excellence in scientific research and teaching, especially in developing geographical areas, with an emphasis on advanced studies and original research in physics and overlapping disciplines. To achieve its mission, the Institute is working in partnerships with other US and foreign research organizations and institutions of learning. The Whole Earth Telescope (WET) exemplifies the Institute's objectives and has become one of IITAP's largest and most successful projects.

Key words: history of astronomy – miscellaneous

1. Short history of IITAP

For this occasion, I will only mention a few significant milestones since the inception of efforts to set up the IITAP.

In October 1991, Professor Abdus Salam, Nobel Laureate in Physics, encouraged Iowa State University to form an institute similar to the International Centre for Theoretical Physics in Trieste, Italy, which he founded. After three meetings between Professor Salam and ISU President Martin Jischke, in Ames and in Trieste, Professor Salam supported the framework proposed by ISU.

ISU then set about to propose a partnership with UNESCO to support the Institute and the name International Institute of Theoretical and Applied Physics or "IITAP" (pronounced "Eye-Tap") emerged from this process.

In September 1993, ISU formally submitted its proposal to UNESCO which presented the mission, scope and organization of the Institute. UNESCO quickly accepted the proposal and formed the partnership with ISU to support IITAP.

Almost simultaneously, IITAP was approved by the Iowa Board of Regents as a unit of Iowa State University reporting to the President and Provost.

Late in 1993 and early in 1994 IITAP conducted reviews of proposals for specific projects. The review process identified WET as a potentially timely and significant initiative for IITAP's mission.

In April 1994, IITAP hosted its first international meeting, a planning meeting, to work on the initial scientific programs. Based on the outcome of that meeting, efforts to start running conferences and specific projects were accelerated.

At this planning meeting, Steve Kawaler presented WET's achievements and proposal to make WET an IITAP Project. His proposal received the enthusiastic support of the meeting's participants. IITAP has had extensive meetings with Ed Nather and has designated Steve Kawaler and Chris Clemens as IITAP Project co-Coordinators for WET. IITAP now provides substantial funding for WET.

2. IITAP's goals

The mission of the IITAP is to foster excellence in scientific research and teaching, especially in developing geographical areas, with an emphasis on advanced studies and original research in physics and overlapping disciplines.

The Institute is open to qualified scientists of all countries. The Institute provides an open forum for scientific dialogue and furnishes modern facilities for research and collaboration among all participants of its scientific programs.

The Institute will form long-term partnerships with research and teaching institutions in developing countries to help strengthen their infrastructure in science and technology.

To achieve its mission, the Institute is working in partnerships with other US research organizations and institutions of learning.

With its global collaboration among observers and observatories, its emphasis on forefront science and its principles of a participatory process in setting and achieving its scientific goals, the WET serves as a prime model for IITAP projects.

3. Scope of programs

During the initial phase of operations, IITAP has three priorities for its activities:

- establish core programs in Physics and Astronomy as well as closely overlapping areas of Chemistry, Mathematics and Engineering;
- organize and run workshops, schools and conferences both at IITAP and, as regional activities, at other locations;
- establish a short-term visitor program to foster collaborations, especially in conjunction with topics of workshops, schools and conferences at IITAP;
- establish a visitor program to support visits to IITAP of up to one year with emphasis on visits in conjunction with scientific thrust area activities.

An additional priority which is presently under evaluation for IITAP is to establish faculty development or "capacity-building" programs in partnerships with colleges and universities in the Third World.

All the established IITAP programs are working in concert with the WET Project. This workshop manifests another success of these programs in assisting WET to achieve its scientific objectives.

4. Initial thrust areas

The following table outlines IITAP's major initial thrust areas. Each area is led by a senior scientist. WET is the largest project in the Fundamental Science Thrust Area.

Applied science
David K. Hoffman

Solar Energy, Materials for Economic Development and Environmental Enhancement, Non-Destructive Evaluation of Materials, Mathematical & Physical Modeling In Engineering (Transportation, Energy Transfer, Water Resources).

Environmental/Earth Science
Gene S. Takle
Regional Atmospheric Modeling for Environmental Management, Global Climate Change, Preservation of Climate Data Bases.

Fundamental Science
Bing-Lin Young
Astronomy and Astrophysics, Condensed Matter, Elementary Particles & Nuclei and Mathematical Physics.

Materials Science
David W. Lynch
Superconductivity, Phase Transitions, Optical Properties of Inhomogeneous Media, Amorphous Materials.

Computers/Communications
Bruce N. Harmon
International Science Networking, Remote Access to Data and Science Literature, Computational Physics.

Biophysics
Jon B. Applequist
High-Resolution Structures of Biological Macromolecules, Optical Properties of Biological Systems, Computational Molecular Biology, Scanned Probe Microscopy.

5. IITAP's recent and planned activities

April 29 - 30, 1994. Program Planning Workshop.
June 20 - September 9, 1994. Summer Program Networks for Use in Math and Physical Sciences (NUMAPS).
August 2 - August 12, 1994. Stellar Seismology with the Whole Earth Telescope.
August 8 - September 9, 1994. Workshop on Fundamental Physics Applications of QCD and Electroweak Theory.
October 3 - 5, 1994. International Conference on Science in Central America, San Salvador, El Salvador.
November 16 - 18, 1994. Planning Workshop on Mesoscale Atmospheric Modeling.
November 17, 1994. ISU Presidential Lecture: "Culture of Peace: Science, Education and UNESCO" Dr. Federico Mayor, Director General, UNESCO.
December 4 - 5, 1994. Workshop on Photovoltaic R&D Opportunities, Waikoloa, Hawaii.

January 21, 1995. Workshop on Networks for Use in Math and Physical Sciences (NUMAPS).

May 17 - 26, 1995. International Workshops and Symposium on Particle Theory and Phenomenology Workshops, May 17–19 and 25-26, Symposium May 22–24.

June 1 - August 31, 1995. Summer Program Networks for Use in Math and Physical Sciences (NUMAPS).

July 10 - 23, 1995. International Whole Earth Telescope (WET) School and Workshop on Stellar Seismology.

All activities are held at IITAP except those specifically noted above. Reports of recently completed activities are available via IITAP WWW Server at the URL: http://www.physics.iastate.edu/.

6. IITAP's information server

Since WET makes extensive use of modern communication technologies, I will introduce another IITAP initiative which is working closely with WET.

As part of IITAP's Computers/Communication thrust, we are developing an information server for the international scientific community available over Internet. Access is free and can be accomplished via VT-100 emulation logon or through World Wide Web (WWW) clients like Mosaic (URL: http://www.physics.iastate.edu/). For more information on how to access this server, send an e-mail request to iitap_help@iastate.edu.

IITAP's server provides a user-friendly environment to access a vast amount of information over the Internet. This includes journals that are available on-line, data bases, preprint libraries, newsletters, computer program libraries, and much more. The server utilizes a "hypertext" format which dynamically links the user to information and interactive media. Subsequent links then lead to additional information over a dendritic structure.

Although the information available through this server is growing rapidly, the server is not a replacement for a university library. For access to all scientific literature, IITAP is experimenting with a Document Delivery Service. Through this service, a scientist anywhere on Internet, will have rapid access to all the literature at Iowa State University's extensive library collection. The goal is to enable any university library to make an inter-library loan agreement with ISU's library after the experimental phase is completed. For

more information on the Document Delivery Service, send an e-mail message to iitap@iastate.edu.

7. External sources of support to date

IITAP is pleased to acknowledge initial financial support received from the following organizations for its activities:

Iowa State University,

United Nations Educational, Scientific and Cultural Organization,

United Technologies Corporation,

U.S. National Science Foundation,

U.S. Department of Energy,

National Aeronautics and Space Administration,

International Science Foundation,

Organization of American States,

Rockefeller Foundation,

Third World Academy of Sciences.

8. Conclusion

It has been a pleasure for me to have this opportunity to share with you the development of IITAP and the role played by the WET Project. Based on WET's long standing achievements prior to involvement with IITAP and the recent progress together, I believe we should be aggressive in our planning for a future of extended WET successes.