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# **INTERNATIONAL CONFERENCE ON SHALLOW-WATER ACOUSTICS (SWAC' 97, Beijing, China)**

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## **LONG-TERM GOALS**

To strengthen international cooperation and academic exchange on basic research in ocean acoustics which address the physics of the acoustic generation, propagation and scattering in the varying coastal ocean environment.

## **SCIENTIFIC AND TECHNOLOGICAL OBJECTIVES**

To encourage eastern and western marine acousticians to bring together diverse and unique perspectives, experience, talents, and expertise, and to establish close personal and professional contact and to set up a long-term Asian-Pacific cooperative program on shallow-water acoustics.

## **BACKGROUND**

Shallow water acoustics is currently a topic of great interest world-wide. Strong boundary interaction, multipath propagation and a complex and variable environment make it an extremely challenging field. An international conference could offer the first comprehensive environment in which shallow-water acoustics experts from many nations can exchange information and discuss subjects of common interest.

Since 1989, Georgia Tech and the Institute of Acoustics, Chinese Academy of Sciences (IOA,CAS) have established a close relationship in shallow-water acoustics research, including mutual visits and information exchanges. Georgia Tech has supported four Chinese scholars at the Georgia Tech campus. Under the sponsorship of the ONR and the CAS, the first USA-China joint experiment was conducted in the Yellow Sea in the summer of 1996 by researchers from GA Tech, IOA(CAS), APL of University of Washington and the South China Sea Institute of Oceanology(CAS). The conference could provide a forum for the presentation of the initial results of the joint Yellow Sea experiment, and further encourage the interaction between American and Chinese shallow-water acousticians and also expand this interaction to include other nations.

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## **APPROACH**

The principal sponsor of the International Shallow-Water Acoustics Conference (SWAC'97) was the ONR Ocean Acoustics Program. Other co-sponsors included the Chinese Academy of Sciences, Natural Science Foundation of China, and the China State Shipbuilding Corporation. The conference was jointly organized by the Institute of Acoustics (CAS), Georgia Institute of Technology and Naval Postgraduate School. The International Shallow-Water Acoustics Conference (SWAC '97) was held at the Grand Hotel, Beijing, China on 21-25 April. Nonparallel sessions were used to assure conference participants had access to each paper.

## **RESULTS**

The conference was attended by more than 120 scientists from 17 countries and regions. The participants in SWAC '97 included most of today's leading marine acousticians. Over the 5 days of the conference a broad range of topics on shallow-water acoustics were covered which focused on the unique environments associated with all aspects of the shallow-water acoustics.

The papers (including 41 invited papers) were grouped into eight sessions: 1 - China-USA cooperative research; 2 - Theoretical and computational acoustics; 3 - Sound propagation and seafloor characterization; 4 - Effect of water column variability; 5 - Reverberation and bottom scattering; 6- High frequency acoustics/Scattering from surfaces and bubbles/Ambient noise; 7 - Acoustic tomography; 8 - Signal processing/ Instruments.

The presenters also included representatives from several new multi-national and multi-institutional groups that had recently performed large-scale, at-sea experiments, where acoustic and oceanographic data were simultaneously collected in shallow water. These experiments highlight two recent trends in shallow-water acoustics research. First, while there have been significant advances in computational modeling and data processing over the last two decades, shallow water acoustics is still severely limited by a lack of high quality field data. In response to this, more emphasis is being placed on field observations of ocean phenomena. Second, reduced budgets and the increased costs of major experiments have motivated multiinstitutional, interdisciplinary groups (acousticians / oceanographers) to team together. The technological advances of the information age have made the resultant cooperative research and at-sea experiments more effective.

All the papers presented at the conference have been published in a book titled <Shallow-Water Acoustics> by China Ocean Press.[1]

After the conference, the US Ocean Acoustics Delegation visited many ocean acoustics and oceanography research institutes and universities in China. As a follow-on to SWAC '97, the delegation members are developing an Asian-Pacific cooperative research program on shallow-water acoustics. Preliminary discussions on research topics,

contributed resources and at-sea experimental sites were discussed on the ONR supported Shallow-water Acoustics Workshop held in December, 1997 at San Francisco (hosted by Dr. Ching-Sang Chiu.)

**REFERENCE**

- [1] <Shallow-Water Acoustics>, R.H. Zhang and J.X. Zhou, eds, China Ocean Press(1997)