

# **The STC Program with Emphasis on the University of Hawaii: A Presentation for a Representative of Senator Inouye's Office**

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**National Science Foundation, Room 1295**

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# Vision

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**The STC Program supports  
innovation in the integrative  
conduct of research, education  
and knowledge transfer  
through partnerships.**



# History

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- **First STC Competition, 1987.**
- **Two competitions in late 80's for STCs yielded 25 centers.**
- **Evaluation of the program against its goals and the NSF strategic plan.**
- **1996 the National Science Board approved New Program Competition every three years with a final steady-state budget of about \$75 million.**



# History Continued

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- Five New Centers Funded in 2000**
- Six New Centers Funded in 2002**
- Two New Centers in FY 2005**
- Four New Centers to Be Funded in FY 2006**



# The Science and Technology Centers Program

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## Three Main Thrust Areas:

- Highest quality research
- Integration of the research with education
- Knowledge (technology) transfer through partnerships



# The Program

## Science and Technology Centers (STC): Integrative Partnerships

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- To support research and education of the highest quality;
- To exploit opportunities in science, engineering and technology where the complexity of the research agenda requires the advantages of scope, scale, change, duration, equipment and facilities, that a Center can provide;
- To support frontier investigations at the interfaces of disciplines, and/or fresh approaches within disciplines;
- To engage the Nation's intellectual talent, robustly drawn from its full human diversity, in the conduct of research and education activities;



# The Program

## Science and Technology Centers (STC): Integrative Partnerships

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- To promote organizational connections and linkages within and between campuses, schools and/or the world beyond (state, local, federal agencies, national labs, industry, international);
- To focus on integrative learning and discovery and the preparation of U.S. students for abroad set of career paths; and
- To foster science and engineering in service to society especially with respect to new research areas, promising new instrumentation and potential new technologies.



# Basic Center Organization

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- Basic research and education theme;
- Based at an academic institution, with partnering institution and/or industries;
- Has an external advisory body (without conflicts) composed of interested parties;





# Basic Center Organization

Continued

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- Has one Center Director, as well as someone responsible for detailed center management, an associate responsible for education activities, and an associate responsible for knowledge transfer;
- Has a maximum of ten years, with a two-year phase-out period (years 9 and 10);
- May be terminated in year five if not successful;
- Has about \$1.5 million to \$4.0 million of NSF support per year, plus other support from partners.



# Originating Review Process

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## → Merit Review

- ✓ Expert Panels (Peer Review)
- ✓ Preliminary Proposals - Concept Paper

## → Selection Process

- ✓ Full Proposals
- ✓ Site Visits
- ✓ Blue Ribbon Panel



# The STC Process

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- **NSF Announcement of Competition: Solicitation – NSF 03-550**
- **164 Preliminary Proposals Received in June 2003**
- **159 Preliminary Proposals - Panel review only (September 2003)**
- **Invited List of 38 (37 Submitted Full Proposals), and Informed Declines – October 2003**
- **Invited full proposals for ad hoc and panel reviews in March - May 2004**



# The STC Process Continued

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- **May – July 2004, Identified Experts for Site Visit Teams**
- **Held Site Visits in September-October 2004 Timeframe**
- **NSF Ad Hoc STC Advisory Committee (Blue Ribbon Panel) Meeting Held – December 2004**
- **NSF Internal Action on the Recommendations of Reviewers**



The Proposed

# University of Hawaii STC

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## Proposal Title:

Center for Microbial Oceanography: Research  
and Education (C-MORE)

## Lead Institution:

University of Hawaii

## Principal Investigator:

Dr. David M. Karl

## Proposal Number:

0424599



The Proposed

# University of Hawaii STC Continued

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## ❑ The Center's Scientific Focus:

❑ The Center for Microbial Oceanography Research and Education (C-MORE) headquartered at the University of Hawaii (UH) will bring together a multidisciplinary team of scientists and educators to focus on the identities, roles and impacts of microorganisms in the world's largest biome – the ocean.

### ❑ Research Foci:

- ❑ Genomic, physiological and other aspects of microbial diversity;
- ❑ The role of microbial metabolism in elemental cycling;
- ❑ Development and deployment of novel sensors and instruments for remote automated sampling and processing; and
- ❑ Computer simulation, modeling and forecasting of ecosystem processes.



The Proposed

# University of Hawaii STC Continued

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- ❑ **The Importance of the Center's Scientific Foci:**
  - ❑ Oceanographic, microbiological, genomic, geochemical, informatic and computational methods will be the means through which these foci are integrated with one another via team studies of the North Pacific subtropical gyre.
  - ❑ The result will be the first high resolution view of inter-dependent microbial lifestyles and processes that govern the flow of energy and elements in the ocean.



## The Proposed

# University of Hawaii STC Continued

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- ❑ The Importance of the Center's Scientific Foci Continued:
  - ❑ More than half the biomass on Earth is made up of microorganisms: bacteria, archaea, protists, fungi, unicellular algae and viruses.
  - ❑ They are the most abundant and diverse forms of life on our planet and are the chief engineers of the global carbon, nitrogen and phosphorus cycles.
    - ❑ Paradoxically, microbes are also the life forms about which we know the least.
  - ❑ Startling advances in environmental genomics and high performance computing are now enabling researchers to decipher the genetic code of entire communities of microorganisms.
    - ❑ When coupled with advances in automated remote-controlled submersible technologies, this will make possible the deployment of genomic sensors to examine, with unprecedented resolving power, the properties and activities of microorganisms on our planet.





The Proposed

# University of Hawaii STC Continued

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## PARTNER INSTITUTIONS

### Institutions

- Massachusetts Institute of Technology
- Oregon State University
- University of California at Santa Cruz
- University of Hawaii – The STC Lead Institution
- Woods Hole Oceanographic Institution
- Monterey Bay Aquarium Research Institute



# The Proposed University of Hawaii STC Continued

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## PROJECT PERSONNEL

	Last Name	First Name	Institution/Organization
➤	Bidigare,	Robert	University of Hawaii
➤	Boyle,	Edward	Massachusetts Institute of Technology
➤	Chinn,	Pauline	University of Hawaii
➤	Chisholm,	Sallie	Massachusetts Institute of Technology
➤	Church,	Matthew	University of California at Santa Cruz
➤	DeLong,	Edward	Massachusetts Institute of Technology
➤	Doney,	Scott	Woods Hole Oceanographic Institution
➤	Dyhrman,	Sonya	Woods Hole Oceanographic Institution
➤	Helmreich,	Stefan	Massachusetts Institute of Technology
➤	Karl,	David	University of Hawaii
➤	Klemm,	Barbara	University of Hawaii
➤	Laws,	Edward	University of Hawaii
➤	Letelier,	Ricardo	Oregon State University
➤	Rappé,	Michael	University of Hawaii
➤	Repeta,	Daniel	Woods Hole Oceanographic Institution
➤	Saito,	Mak	Woods Hole Oceanographic Institution
➤	Steward,	Grieg	University of Hawaii
➤	Vergun,	Judith	University of Hawaii
➤	Taylor,	Craig	Woods Hole Oceanographic Institution
➤	Waterbury,	John	Woods Hole Oceanographic Institution
➤	Webb,	Eric	Woods Hole Oceanographic Institution
➤	Zehr,	Jonathan	University of California at Santa Cruz
➤	Kolber,	Zbigniew	Monterey Bay Aquarium Research Institute
➤	Scholin,	Chris	Monterey Bay Aquarium Research Institute



The Proposed

# University of Hawaii STC Continued

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## Project Personnel: Number of Student Participants\*

	University of Hawaii	Massachusetts Institute of Technology	Monterey Bay Aquarium Research Institute	Oregon State University	University of California at Santa Cruz	Woods Hole Oceanographic Institution
Post-Doctoral Fellows	15	15	5	0	5	0
Graduate Students	15	20	0	4	5	15
Under-graduates	0	10	0	0	0	0

\*Data in this table are those submitted prior to the budget rescission. The number of students shown is those who will receive stipends from the NSF funding.



The Proposed  
**University of Hawaii STC** Continued

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**EXTERNAL ADVISORY COMMITTEE MEMBERS**

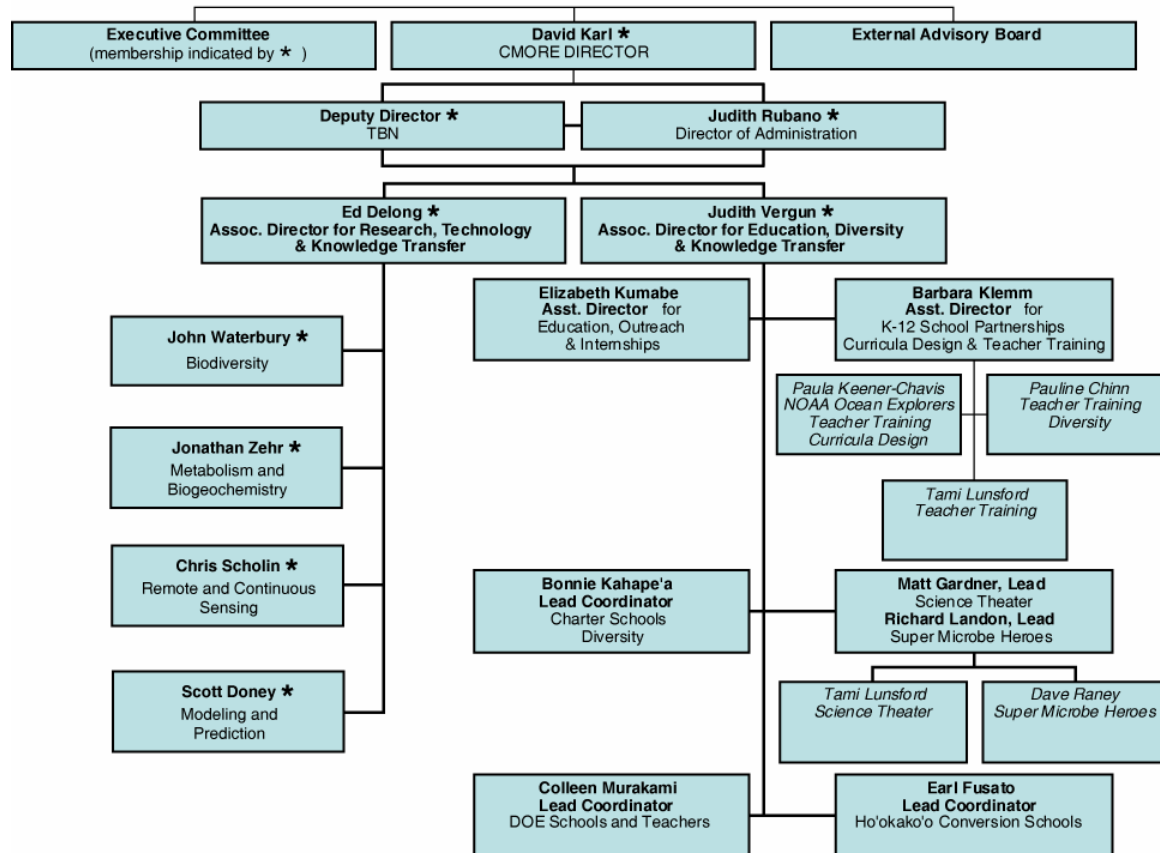
<b>Last Name</b>	<b>First Name</b>	<b>Affiliation</b>
■ Abbott,	Isabella	Bishop Museum/Stanford University
■ Hayes,	John	Woods Hole Oceanographic Institution
■ Pace,	Norman	University of Colorado, Boulder
■ Rubin,	Eddy	Lawrence Berkeley Laboratory
■ Simon,	Melvin	Agouon Institute/Cal Tech



# University of Hawaii STC

## Draft Organizational Structure

### C-MORE : Organizational Structure



The Proposed

# University of Hawaii STC Continued

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- ❑ C-MORE will integrate the four research themes and their objectives with a varied and diverse portfolio of education and outreach activities for students of all ages. The Center will push interdisciplinary collaboration between faculty, students and postdoctoral scientists in an accelerated fashion to train a new breed of microbial oceanographer, and will help to train teachers and develop curricula at the undergraduate and secondary education levels. Implementation of these activities is also designed to increase the number of students and teachers engaged in quantitative sciences and engineering, focusing on underrepresented groups in science, especially Native Hawaiians and other Pacific Islanders.



The Proposed

# University of Hawaii STC Continued

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- ❑ The consolidated efforts of the Center will drive research in microbial oceanography forward at a vastly accelerated rate. Automated remote and in situ sampling and sensing platforms, coupled with mathematical modeling will provide a template for future networks of microbial observing systems. These will provide the sort of information that science and society require to understand and manage our changing Earth system.



# **About the Pending NSF STC Award to the University of Hawaii**

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- **Five Year Award with Option to Continue for a Total of Ten Years**
- **Award for Year 1 = \$2.96 Million**
- **Start Date: July 1, 2006**
- **Method of Award: Cooperative Agreement**





# About the Pending NSF STC Award to the University of Hawaii Continued

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- **NSF Management of the Center**
  - **Shared Governance with oversight by NSF STC Management Team**
    - **Dr. Matthew Kane of Directorate for Biological Sciences – NSF STC Management Team Leader for the University of Hawaii STC,**
    - **Dr. Phillip Taylor of the Directorate for Geosciences,**
    - **Dr. David Campbell of the Directorate for Education and Human Resources – Education Expert, and**
    - **Dr. Margaret E. M. Tolbert of the Office of Integrative Activities/Office of the Director.**



# Lessons Learned Through Intermediate Evaluation

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The NSF STC Management Team will have oversight of the Center. Some of its duties are as shown below:

- Ensure that NSF pays close attention to the changes in the STC leadership and management team;
- Ensure the development and implementation of a strategic and implementation plan for the Center;
- Ensure that the external advisory bodies of the Center meet routinely, and that their advise is heard both at the Center (institution) and at NSF;
- Have annual site-visits but only one (4<sup>th</sup>-year) critical review that could terminate the Center;
- Ensure simplicity and timeliness of a database that allows reviewers to access the progress of Centers in a given area.
- Etc.



# Where are we now?

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- **23 Centers – Graduated**
- **13 Centers — Currently Active**
- **Current Competition in Progress**
  - ✓ **Awards to four new STCs, including the University of Hawaii, planned for FY 2006**



# Next Steps

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- Revised Year 1 budgets to be submitted to the appropriate Technical Coordinator—Leader of the NSF STC Management Team—via e-mail by the Principal Investigator at the Lead Institutions (e.g., University of Hawaii)
- Revised budget to be reviewed and approved by the NSF STC Management Team and response sent to the Principal Investigator
- Revised budget to be officially submitted by the Authorized Official Representative at the Lead Institution via the NSF FastLane System
- The Cooperative Agreement to be signed by a representative of NSF's Grants Office and the Authorized Official Representative at the Lead Institution



# Next Steps Continued

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- **Negotiations between NSF and Lead Institution on the Cooperative Agreement – Currently in progress**
- **STC Strategic Planning Retreat to be held to draft the STC Strategic and Implementation Plan – May 26-27, 2006 in Honolulu, Hawaii**
- **Draft STC Strategic and Implementation Plan to be reviewed and acted on by the NSF STC Management Team**
- **When NSF and the University of Hawaii agree on the terms of the cooperative agreement and the revised budget and draft Strategic and Implementation Plan have been approved, the Cooperative Agreement will be signed, and the operation of the Center will begin on July 1, 2006.**

