The Space Congress® Proceedings

1996 (33rd) America's Space Program -What's Ahead?

Apr 24th, 2:00 PM - 5:00 PM

Paper Session II-C - An Inventory of Florida's Space-Related Academic Support Capabilities

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An Inventory of Florida's Space-Related Academic Support Capabilities

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ABSTRACT

The University of Central Florida, in cooperation with the Spaceport Florida Authority, is developing an inventory of Florida's university and college-level space research, education/training capabilities and programs. Upon completion in early 1996, the inventory will be useful in the following ways: 1) space-related companies and agencies will use the inventory to select academic capabilities to support their programs; 2) the inventory will be distributed among the state's academic institutions to enable teaming for research projects and grants; 3) the inventory will allow the academic community and Florida's university system administrators to better understand their strengths and weaknesses in the space field; 4) and the inventory will be useful to local and state economic development organizations in attracting new space-related business to Florida.

SIGNIFICANCE OF THE PROJECT

Florida has many academic institutions; there are 32 universities/colleges and 28 community colleges in Florida. These institutions have had a varied and diverse involvement in our nation's space program. Unfortunately, while our capabilities in many space-related scientific and technological areas are strong, our success in attracting new research projects has been limited. To increase opportunities for Florida's universities and the community colleges, the Spaceport Florida Authority and the University of Central Florida seeks to catalog the involvement and capabilities of each institution to reflect the space-related strengths of the Florida institutions. This assessment will facilitate the building of technical teams among the Florida universities/colleges and industry to pursue the projects now sponsored by NASA, DOD and other agencies, to increase our institutional knowledge in exploring space, and to grow the space-related industry in Florida.

BACKGROUND

Over the past five years, Spaceport Florida Authority (SFA) has been dedicated to sponsoring space research and development capabilities that will be useful in Florida's efforts to attract and maintain the aerospace industry. Moreover, SFA is providing the leadership to increase NASA and Air Force awareness of our state's capacity to support their missions.

SFA has initiated several Federal and industry funded projects that will enhance the launch infrastructure and add to Florida's launch support capability. Plans are in preparation to sponsor a "Customer Service Center" (CSC) to provide launch monitoring, technical support, and space (office/laboratory) for payload teams in preparation of their missions. With a strong requirement from payload users, the CSC may include a Satellite Ground Station (SGS). Recently Governor Chiles has proposed a plan to strengthen the state's historically significant role as a center for aerospace industry by transitioning Cape Canaveral into an international spaceport. " Creating a Florida-based international spaceport at Cape Canaveral would provide additional capacity and greater synergy to domestic satellite builders and would augment the joint development of the international space station," Governor Chiles said. "It would also offset some of the economic and job impacts to Florida of recent defense downsizing, and reductions in NASA's workforce."

Working with the Board of Regents and Division of Community Colleges, the Spaceport authority initiated an assessment of Florida's space-related research and education capabilities in August of 1995. Letters were sent out at that time requesting that each institution provide brief descriptions of their current, past (last five years) and projected involvement in space education and research. Again, in November 1995 a follow-on request to selected universities was made by FAX. The information received is contained in an "ACCESS" database and is described in the following sections. It is the intention of SFA to disseminate this "database" to industry (through the Florida Space Business Roundtable), NASA and the Air Force so that they know where the technical expertise/interest within the state of Florida resides. This "database" will also be a valuable asset to SFA to carry out their plans to implement the Customer Service Center concept and to attract international launch systems to Cape Canaveral.

TECHNICAL APPROACH

To identify the technical experience and research of different universities and colleges about space education, a consolidated Florida Space Education and Research Database (FSERD) is being developed. This database uses Microsoft ACCESS, a relational database management systems for Microsoft Windows.

FSERD can be loaded in a Microsoft ACCESS environment. Microsoft ACCESS requirements:

- An IBM compatible personal computer with an 80386sx, 80386, or higher processor

- A hard disk with 19 megabytes of free space for a typical installation.
- A Microsoft Mouse or other compatible pointing device.
- An EGA, VGA, or compatible display (VGA or higher recommended).
- Six megabytes of random-access memory (8 megabytes or more is recommended).
- MS-DOS version 3.1 or later.
- Microsoft Windows, Windows for Workgroups, or Windows NT version 3.1 or later.

FSERD is a menu and button driven database environment. When we open the database, it will show us the first window under the Microsoft ACCESS window as shown below in Fig. **1**

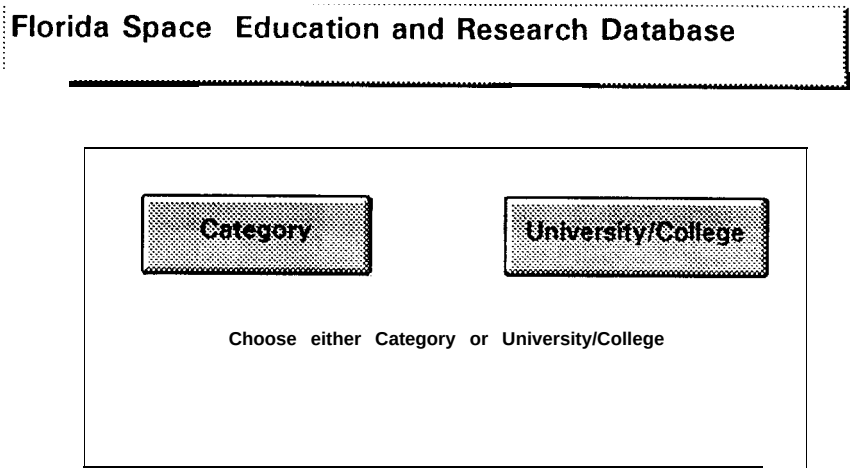

Figure 1: Main form

There are two buttons representing two items, Category and University/College on the Main form. We can go through the database by selecting either of these two items.

Search by Category

If we click the item Category, FSERD will display the Category form with all of the space related research categories. To serve our purpose we have listed every functional title of research that has been performed as well as, those which are ongoing, as received from various participating Institutions under this single Category. The information available regarding these projects have been installed under this program under the item Category in a drop down list box. We can scroll through all the Categories by clicking on the arrow in the box. Therefore, any specific Category can be selected and clicked to display the titles of various research projects.

Category: Astronomy

Project ID:	Title of Project/Capability/Program:
2	Cosmic Ices
4	Astronomy Classes and Public Presentations
28	To Observations of Quasars

Show Project Details

Figure 2: Category form

Category Name
Rocket Propulsion
Rocket Fuels
Telemetry
Space Communications
Remote Sensing from Space (Satellite)
Robotic Systems for Space
Astronomy
Deployable Structures for Space
Human Factors in Space
Space Law and Policy
Space Medicine (Life Support Engineering)
Guidance Systems for Space Vehicles
Aerospace Systems Designs
Aerospace Systems Designs
Machines for Material Processing in Space
Rocket Propulsion
Heat Management for Systems
Control for Flexible Structures
Attitude Control for Space Vehicles (Satellites)
Launch/Spacecraft Instrumentation Applications
Launch Processing (Digital Signal Processing) Automation
Simulation Application (Math Modelling) of Space related Projects
Applied Hypersonic Aerodynamics
Space Navigation Applications
Launch Support Data Acquisition Techniques
Technical Training for Space Launch Vehicle
Explosive Ordinance Training
Upper Atmosphere Research
Geographic Information Systems Using Remote Sensing
Control Systems Design
Applied Mathematics
Space Environmental Aspects

Figure 3: Category list

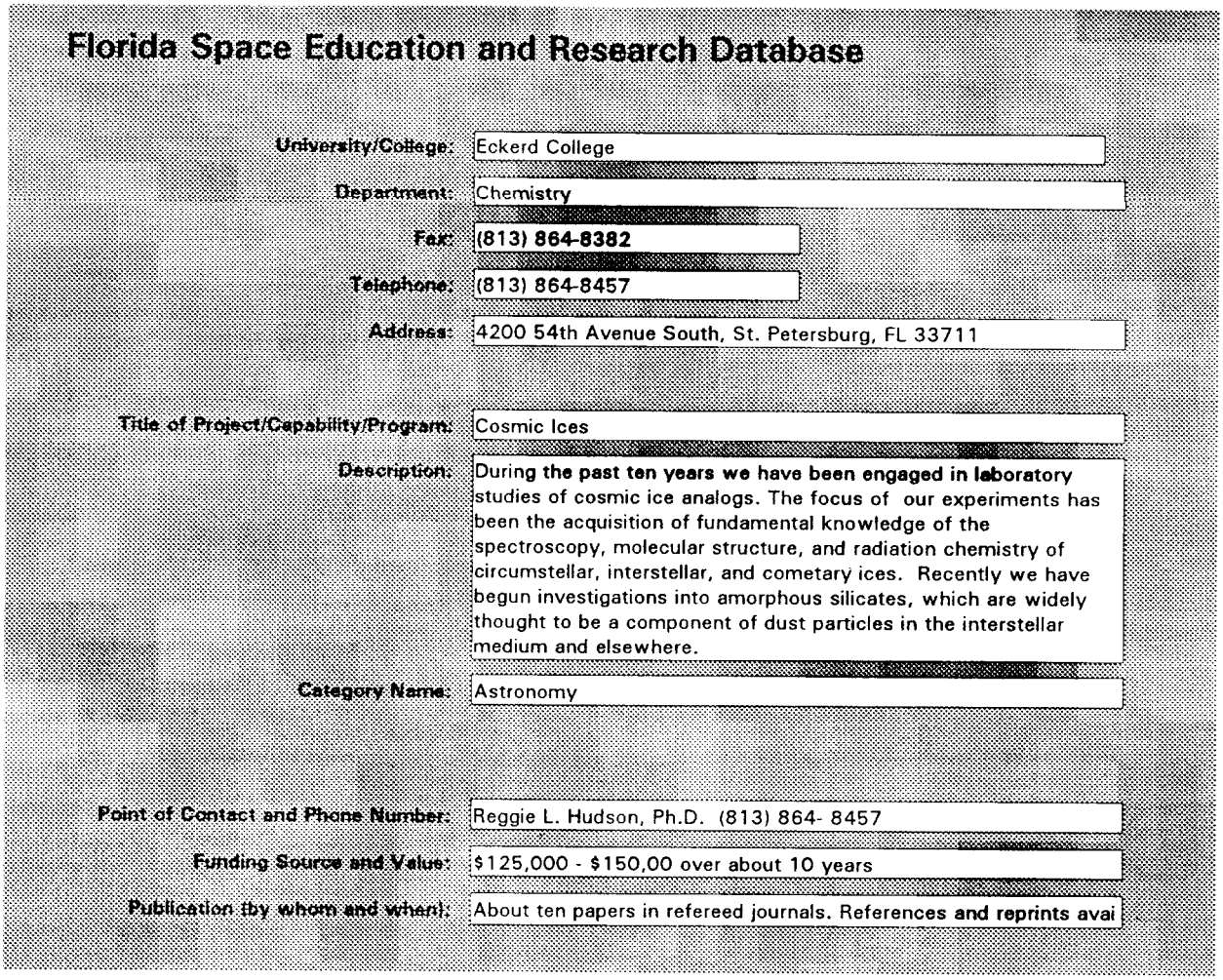

Figure 4: Final form

To demonstrate how this works let us choose the Category “Astronomy” as shown above in Fig. 2 and Fig. 3.

We select and click on Category “Astronomy” and this will display all the projects under it. To obtain the project details about a single project of interest, we select the project and click the button “Show Project Details” (shown in Fig. 4).

As in our example shown, we have selected the project “Cosmic Ices” under “Astronomy” to display us the final project details, e.g., Name of the Institutions, Department , Address, Descriptions of the Project etc.

Search by University/College

We click University/College button on the Main form. Clicking on the arrow in the drop down list box under the University/College Bar will open a list of the names of the Universities/Colleges in Florida. Selecting a specific University/College will display all the space related research projects undertaken by it. By highlighting a specific project title and then clicking on "Show Project Details", FSERD will display the project details , e.g., Name of Universities/Colleges, Department, Address, Title of project , Description of project , Category name etc.

University/College: Florida International University

Project ID:	Title of Project/Capability/Program:
12	Remote Sensing of Phytoplankton Dynamics Using AVIRIS Derived Spectral and Image Data.
13	Algal Spectral Reflectance Signatures and Remote Sensing of Aquatic Environments.
14	Remote sensing of algal bloom dynamics by detecting algal accessory pigments.
15	Detection of algal accessory pigments using AVIRIS data
16	Remote sensing of the biological dynamics of large-scale evaporation ponds.
17	The detection of algal photosynthetic accessory Spectrometer (AVIRIS) Spectral Data.
18	Use of remote sensing coupled with algal accessory pigment data to study phytoplankton bloom dynamics i
19	Utilization of the SFC Database: A Framework for Modeling Shuttle Processing Operations

Show Project Details

Figure 5: University/College form

University/College Name
Barry University
Bethune-Cockman College
Brevard Community College
Broward Community College
Central Florida Community College
Chipola Junior College
Clearwater Christian College
Daytona Beach Community College
Eckerd College
Edison Community College
Edward Waters College
Embry-Riddle Aeronautical University
Flagler College
Florida A&M University
Florida Atlantic University
Florida Community College at Jacksonville
Florida Institute of Technology
Florida International University
Florida Keys Community College
Florida Memorial College
Florida Southern College
Florida State University
Gulf Coast Community College
Hillsborough Community College
Indian River Community College
Jacksonville University
Lake City Community College
Lake-Sumter Community College
Lynn University
Manatee Community College
Miami-Dade Community College
North Florida Community College
Nova Southeastern University
Okaloosa-Walton Community College
Palm Beach Atlantic College
Palm Beach Community College
Pasco-Hernando Community College
Pensacola Junior College
Polk Community College
Ringling School of Art & Design
Rollings College
Saint Leo College
Saint Thomas University
Santa Fe Community College
Seminole Community College
South Florida Community College
St. Johns River Community College
St. Petersburg Junior College
Stetson University
Tallahassee Community College
University of Central Florida
University of Florida
University of Miami
University of North Florida
University of South Florida
University of Tampa
University of West Florida
Valencia Community College
Warner Southern College
Webber College

Figure 6 University/College list

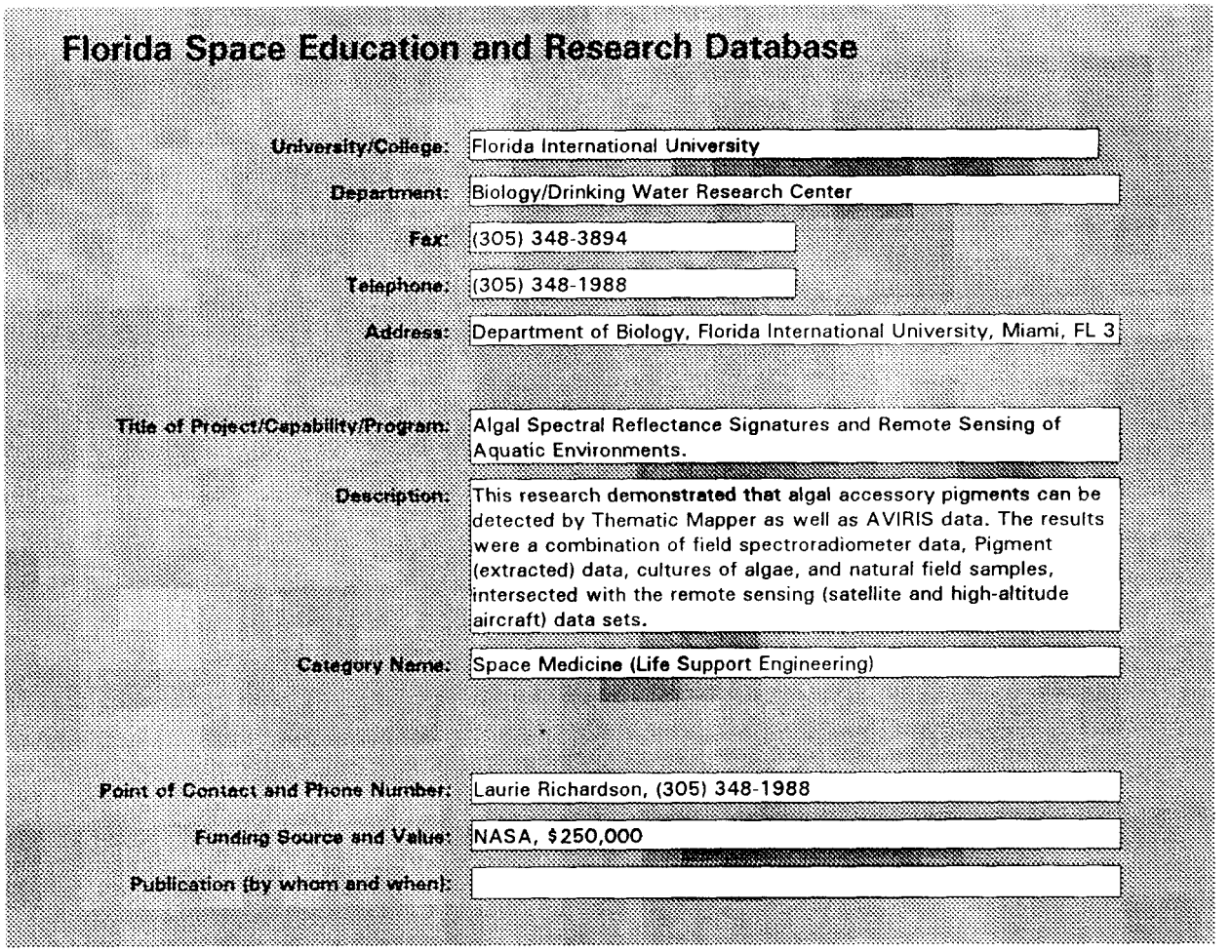

Figure 7: Final form

In our example as shown above in Fig. 5, Fig. 6 and Fig. 7 we have selected Florida International University and then highlighted the project “Algol Spectral Reflectance Signatures & Remote Sensing of Aquatic Environments” to show project details

FSERD is a very simplistically designed database. We can go from one form to another by clicking buttons. To close a form we can either double-click the form’s Control-menu box or choose the Close from the menu.

RELEVANCE TO SPACE RESEARCH

This database of space-related education (courses), research, publications, etc. will be used to bridge the communications gap between industry/government space related launch/spacecraft requirements and the university/college expertise available in Florida. It promised a win-win situation where the industry/government can use Florida's home-grown experts to solve the varied space-related problems in the assembly, test and evaluation and launch of "Launch vehicles/Spacecraft'; the universities/colleges would gain, in turn , finding support for their faculty/student involvement in mutually beneficial research activities.

The database is unfortunately "thin" with respect to generally known capabilities. Current inventory elements now in the database number 126. This (ACCESS) database is designed as a "Living database" in that it can be supplemented as new inputs arrive. Let this paper be an additional call for the flow of these inputs to continue so that SFA'S "Master Database" can be rounded out and used to implement the plans described above. The information needed is portrayed in Fig. 4. Send descriptions of your space-related research and/or academic courses to Dr. Roger W. Johnson.

DATABASE MANAGEMENT, MAINTENANCE AND DISTRIBUTION

FSERD is a client-sewer database. The University of Central Florida in cooperation with the Spaceport Florida Authority will work as the Database Manager; they will have the authority to review and update the existing tables and add to or delete tables and other database objects from the database. Users will only be allowed to open and query the database or download the database to their own system.

A copy of FSERD can be download to interested users with a Run-time Access Version 2.0 or it can be accessed through the Internet Home Page either at the University of Central Florida or at the Spaceport Florida Authority.