

**15<sup>th</sup> United Nations/International Astronautical Federation**

**Workshop on**

**“Space Education and Capacity Building for Sustainable  
Development”**

**October 14 – 15, 2005, Kityakyushu-city, Japan**

**Presentation by:**

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**Space Foundation**

# Insuring Future Generations of Global Competitors in Space

- In preparing future generation for science, technology, engineering, and mathematics, the Space Foundation collaborates with:
  - NASA
  - Department of Education
  - School Districts across the United States
  - PreK-12 Educators
  - PreK-20 Students

The Space Foundation actively responds to this need, with solutions to build the pool of students entering STEM college preparation choices and STEM career fields by:

- K-12 Educators: build knowledge base, skill sets, and teacher strategies
- K-12 Programs: inspire, engage and begin preparing students at the earliest possible age, so they can take appropriate coursework in middle and high school
- University and College Level: internships, mentoring, shadowing programs, and career fair
- Public Engagement (Educators, Parents, Students, Business, Policy makers)

# K-12 Educators:

- Summer Institute – Master’s Space Studies, Graduate level Courses
- Integrated Literacy/Science Model Pre-K through 12th grade
- National Teacher Liaison Program
- National Space in the Classroom Conferences
- Customized In-services
- National Space Symposium – Educator Event
- National Science Standards and Lesson Bank-  
[www.ScienceStandardsLessons.org](http://www.ScienceStandardsLessons.org)
- NASA Educator Resource Center

# Summer Institute 2006



## Space Discovery Graduate Course Schedule

Through graduate courses, the Space Foundation conducts a new model integrating literacy with science, technology, engineering and math. All courses are experiential, hands-on, and immediately transferable to the classroom. Master's degrees are available with an emphasis in Space Studies.

**June 19 – 23 Astronomy Principles for the Classroom**

**June 26 – 30 Space Technologies in the Classroom**

**July 10 – 14 Earth Systems Science**

**July 17 – 21 Rocketry and the Biology of Living in Space,  
Space History and Space Law**

**July 24 – 28 Biological and Physical Research**

# Integrated Literacy Science Model:

- Clearly identified need in American schools
- The number one barrier to student competency, as recognized by the U.S. Department of Education, is the lack of highly qualified teachers in specific content areas
  - Problem particularly pronounced at elementary and middle school levels
  - Teachers want to learn more about science and would teach it more frequently if they felt more competent
  - Teachers do not have enough time to teach science because of literacy expectations and high stakes mandated testing

# Integrated Literacy Science Model (cont):

- Barriers identified
  - Lack of adequate science education preparation
  - Insufficient professional development training
  - Shortage of time
- Removal of barriers
  - Demonstrate to teachers how to integrate science into all content areas
  - Simultaneously increasing student literacy
  - Stimulate and motivate students with interesting topics such as space and science
  - Model customized for individual schools and/or school districts

# Space Foundation Teacher Liaison Program:

- Nationally recognized as advocates in promoting space and science education
- Active link between their school/district, NASA, and the Space Foundation
- Variety of privileges and activities
- Specialized training and instruction
- Free materials and products



# Space in the Classroom Conferences:

- Held in cities across the United States
- Teachers learn how space can a powerful motivator for students
- Educators learn techniques to introduce space topics in their classrooms
- Conferences are customized to each education audience

# Customized In-Services:

- Accredited professional development for educators
- Presented on-site
- Participants earn graduate credit applicable to licensure and teaching credentials
- Tailored to the needs, goals, and curriculum of each school and district



# Educator National Science Standards and Lesson Bank:

- [www.ScienceStandardsLessons.org](http://www.ScienceStandardsLessons.org)
- Comprehensive downloadable lessons
- Aligned with National Science Standards
- Pre-K-2, 3-5, 6-8, 9-12
- Key words
- Objectives
- Subject areas taught
- Timelines
- Background
- Materials
- Extensions
- Evaluations/Assessment
- Resources

# NASA Educator Resource Center:

- Lesson Plans
- Posters
- Instructional Videos
- Books
- Myriad of Teaching Aids

# K-12 Student Programs:

- Student Events – Centennial of Flight, 50 years of Air, Force Space and Missiles
- Space in the Classroom Colorado, Nebraska, Florida
- Student Web Site – [www.DiscoverSpace.org](http://www.DiscoverSpace.org)
- NSS – K-12 student events

# University and College Programs:

- Career Fair
- University Partnerships
- Distance Learning
- PIPES

# Career Fair:

- In conjunction with the National Space Symposium
- Annual event
- Over 600 students from across the United States
  - University and college students
  - Transitioning military
- “Meet the Company” Presentations
- Corporate Booths
- Personalized resume assistance
- Interviews



- University Partnerships and Coalitions
- Distance Learning

# **Key Objectives: The PIPES initiative has the following core objectives:**

- To design, develop, implement, evaluate and disseminate a multi-pronged approach to introducing K-12 grade students to the excitement of study in STEM disciplines, the possibilities of careers in science and technology industries, and the post-secondary education these careers require.
- To develop an innovative, replicable model of sustained partnership collaboration between a university and its local industries, local governmental entities, community-based organizations, and local K-12 education institutions.
- To create a national consortium of institutions of higher education, industry, governmental entities, and K-12 educators to lead the development of an innovative approach to STEM education.

# The Academy Tracks and Initiatives:

**The Teacher Professional Development (TPD) Track:** This track is designed to (i) enhance the STEM content knowledge of the K-12 teacher, (ii) increase the inquiry-based methodologies and pedagogies of the K-12 teacher, and (iii) develop the STEM component of the K-12 teacher so as to promote STEM excitement in the students.

**The K-12 Student Educational Opportunity (SEO) Track:** The SEO track is designed to (i) promote STEM careers and entice K-12 students to consider STEM careers, (ii) offer summer educational opportunities to K-12 students, and (iii) offer university level STEM courses and credit to K-12 students.

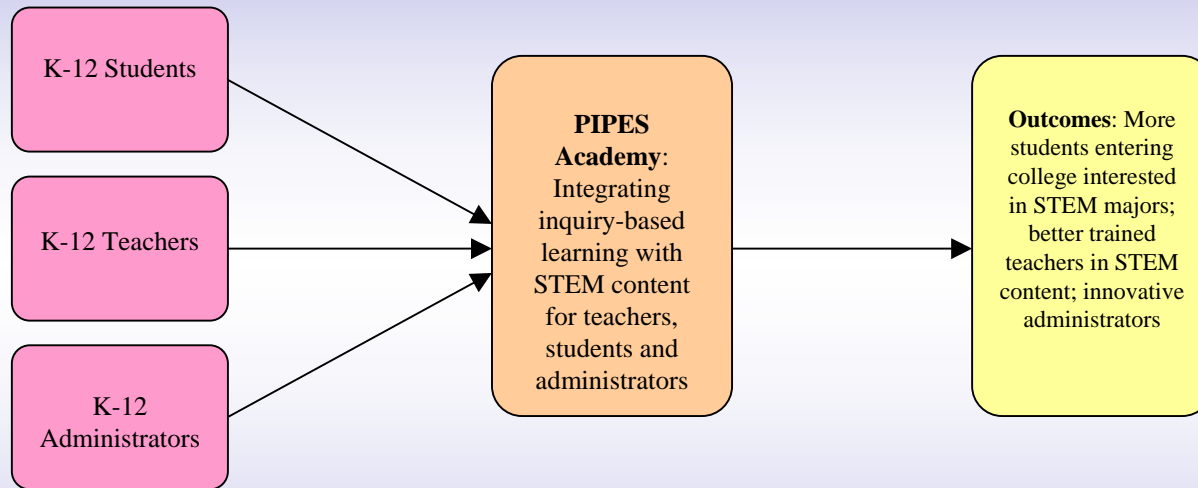
## **The K-12 Administrator Professional Development (APD)**

**Track:** The APD track is designed to advanced professional development for school administrators and counselors who want to emphasize STEM content in their schools.

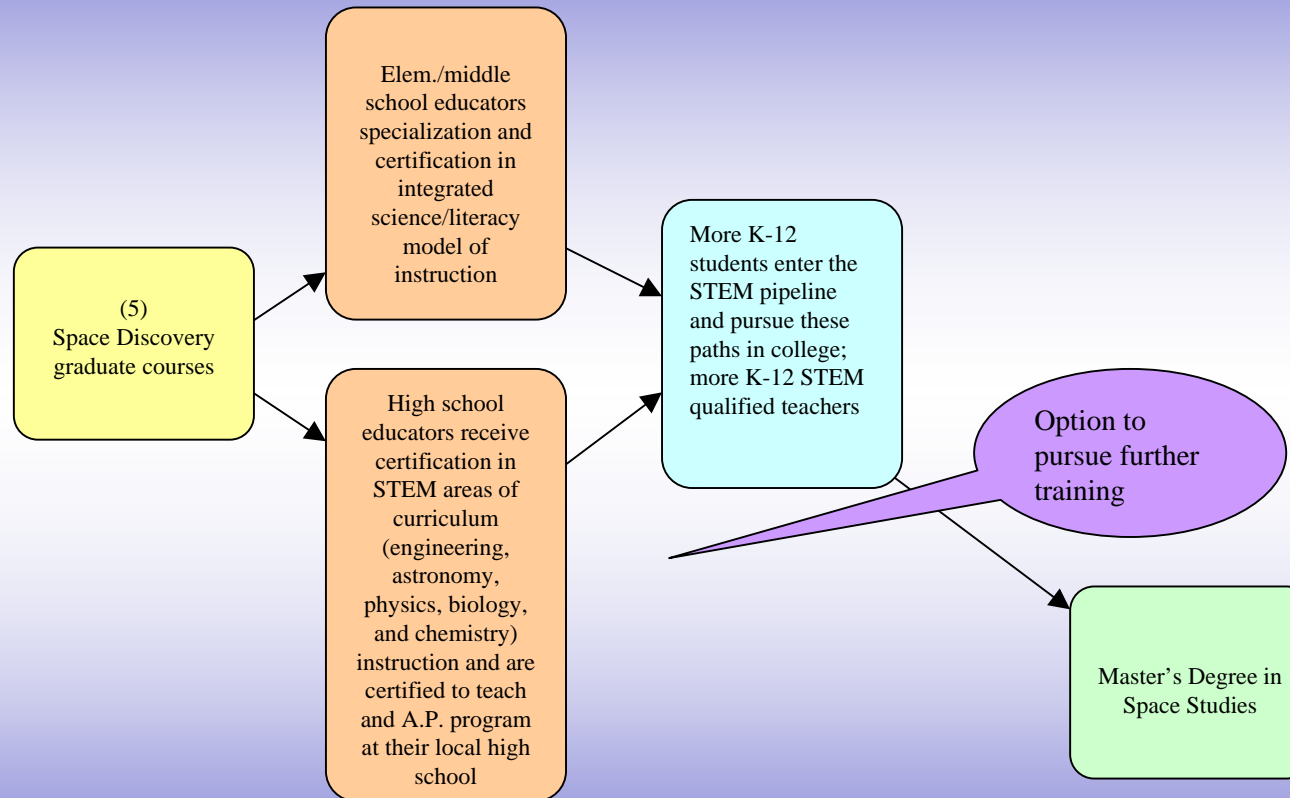
**Replicability/Sustainability/Dissemination:** Project is intended to serve as a national model to bridge access and recruitment gaps at post-secondary institutions and ultimately addresses the impending shortage of scientists and engineers required to meet future workforce demands.

A Trainer of Trainer Model will be used.

# PIPES



# PIPES



# **Public Engagement (Educators, Parents, Students, Business, Policy makers):**

The Space Foundation collaborates with NASA to support NASMETC: National Alliance of Mathematics, Science, and Technology Education Coalition and the State Summits

- Mission: To promote systemic and continuous improvement of math, science, and technology education
- All levels
- Advocating for systemic and continuous improvement of education nation wide

Promoting and supporting a viable coalition of

- Educators
- Policy Makers
- Business
- Public Sector

Serve as a vehicle for discussion and dissemination of innovative ideas and approaches to effective teaching and learning of mathematics, science, engineering and technology.



The Space Foundation has expansive programs Pre-K through adult learners.

We are continually looking for ways to enrich and support educators, our youth, and our local and national, and global community.

