

**The National SMET Education  
Digital Library (NSDL)  
Program: Context and Vision**

**Dr. C. Dianne Martin**

**Division of Undergraduate Education**

**National Science Foundation**

**May 3, 2000**

**InForum2000**



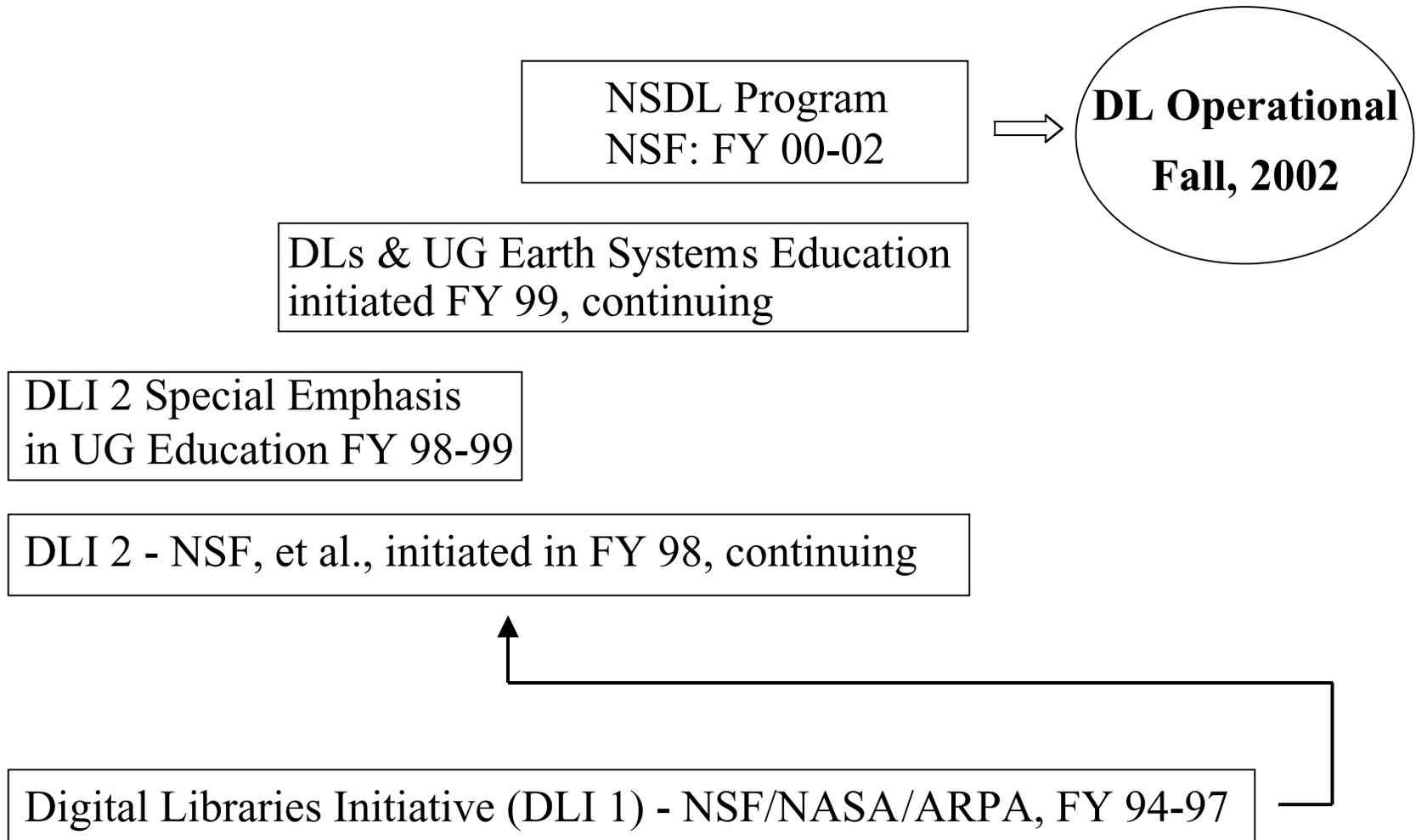
# *di·gi·tal li·bra·ry*

*A managed environment of multimedia materials in digital form, designed for the benefit of its user population, structured to facilitate access to its contents, and equipped with aids to navigate the global network ... with users and holdings totally distributed, but managed as a coherent whole.*

*(Mel Collier, ISDL 97)*



# Programmatic History



# Background Reports

- *Information Technology: Its Impact on Undergraduate Education in Science, Mathematics, Engineering, and Technology* (NSF 98-82), April 18-20, 1996
- *Developing a Digital National Library for Undergraduate Science, Mathematics, Engineering, and Technology Education*, NRC workshop, August 7-8, 1997
- *Report of the SMETE Library Workshop* (NSF 99-112), July 21-23, 1998
- *Serving the Needs of Pre-College Science and Mathematics Education: Impact of a Digital National Library on Teacher Education and Practice*, NRC workshop, September 24-25, 1998
- *Digital Libraries and Education Working Meeting*, January 4-6, 1999
- *Portal to the Future: A Digital Library for Earth System Education*, workshop report, August 8-11, 1999
- *The Digital Libraries Initiative: Update and Discussion*, ASIS Bulletin, October, 1999



## Presidential Directive - 12/17/1999

Subject: Use of Information Technology to Improve Our Society

*13. The Secretary of the Smithsonian Institution, the Director of the National Science Foundation, the Director of the National Park Service, and the Director of the Institute of Museum and Library Services shall work with the private sector and cultural and educational institutions across the country to create a Digital Library of Education to house this country's cultural and educational resources.*



# Working Assumptions

- The WWW is the primary medium (for now)
- Content is a mix of born digital and analog
- There is no lack of great piles of content
- There is a need for coherent piles of great content
- The unit of content can and will decrease in size
- Users will increasingly be creators, and vice versa
- While much of the use will be free, there is a need for multiple models of sustainability

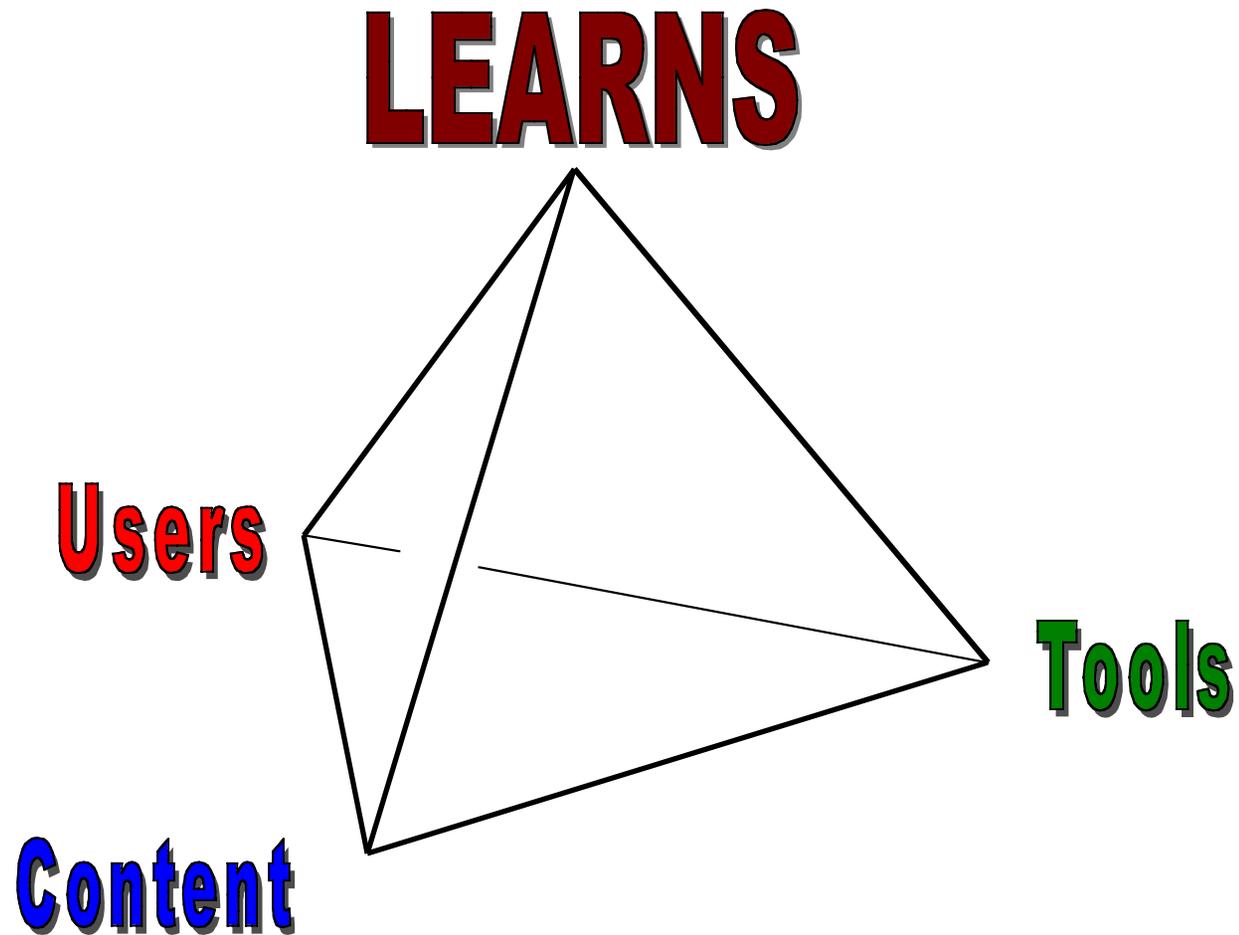


# Vision

## *A Learning Environments and Resources Network for SMET Education (LEARNS)*

- **Designed** to meet the needs of learners, in both individual and collaborative settings
- **Constructed** to enable dynamic use of a broad array of materials for learning, primarily in digital format
- **Managed** actively to promote reliable anytime - anywhere access to quality collections /services, available both within and without the network





**The network is the library.**

# The Network Connects:

***Users:*** students, educators, life-long learners

***Content:*** structured learning materials; large real-time or archived datasets; audio, images, animations; primary sources; digital learning objects (e.g. applets); interactive (virtual, remote) laboratories; ...

***Tools:*** search; refer; validate; integrate; create; customize; publish; share; notify; collaborate; ...





# The Network Supports:

*Learning communities*

**Users**  
(profiles)

*Application services*

**Tools**  
(protocols)

*Customizable collections*

**Content**  
(metadata)



# The Network Enables:

## *Environments for*

- Communication
- Collaboration
- Creation
- Validation
- Evaluation
- Recognition
- ...

AND

- Discovery
- Stability
- Reliability
- Reusability
- Interoperability
- Customizability
- ...

## *of Resources*

## 4 NSDL Program Tracks

- ***CIS:*** to coordinate a distributed alliance of resource collection and service providers, and to ensure reliable and extensible access to and usability of the resulting network of learning environments and resources
- ***Collections:*** to aggregate and actively manage a subset of the digital library's content within a coherent theme or specialty
- ***Services:*** to increase the impact, reach, efficiency, and value of the digital library in its fully operational form
- ***Targeted Research:*** to have immediate impact on one or more of the other three tracks



# Funding the Tracks

(3 funding cycles: FY 2000, 2001, 2002)

- **Core Integration System (first 2 cycles only)**
- **Collections (all three cycles)**
- **Services (all three cycles)**
- **Targeted Research (all three cycles)**
  
- **FY 2000 deadline: April 14, 2000**
- *Anticipated deadlines: April 2001, 2002*



# Anticipated Award Amounts

## FY 2000

- *Core Integration System:* 3-5 awards, up to \$1M each, up to 24 months
- *Collections:* 5-8 awards, 3-5 <\$500K and 2-3 \$1million each, up to 24 months
- *Services:* 6-8 awards, up to \$500K each, up to 24 months
- *Targeted Research:* 4-6 awards, up to \$250K each, up to 24 months



# NSDL Program Budget

- FY 2000 - \$13M
- FY 2001 - \$25M, requested
- FY 2002 - \$20-30M, anticipated





# Goal

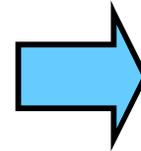
**Core Integration System**

*(FY00 pilots, FY01 full)*

**Collections**

**Services**

**Targeted Research**



***LEARNS***

**operational**

**by 9/ 2002**

**Access, Quality, Coherence**

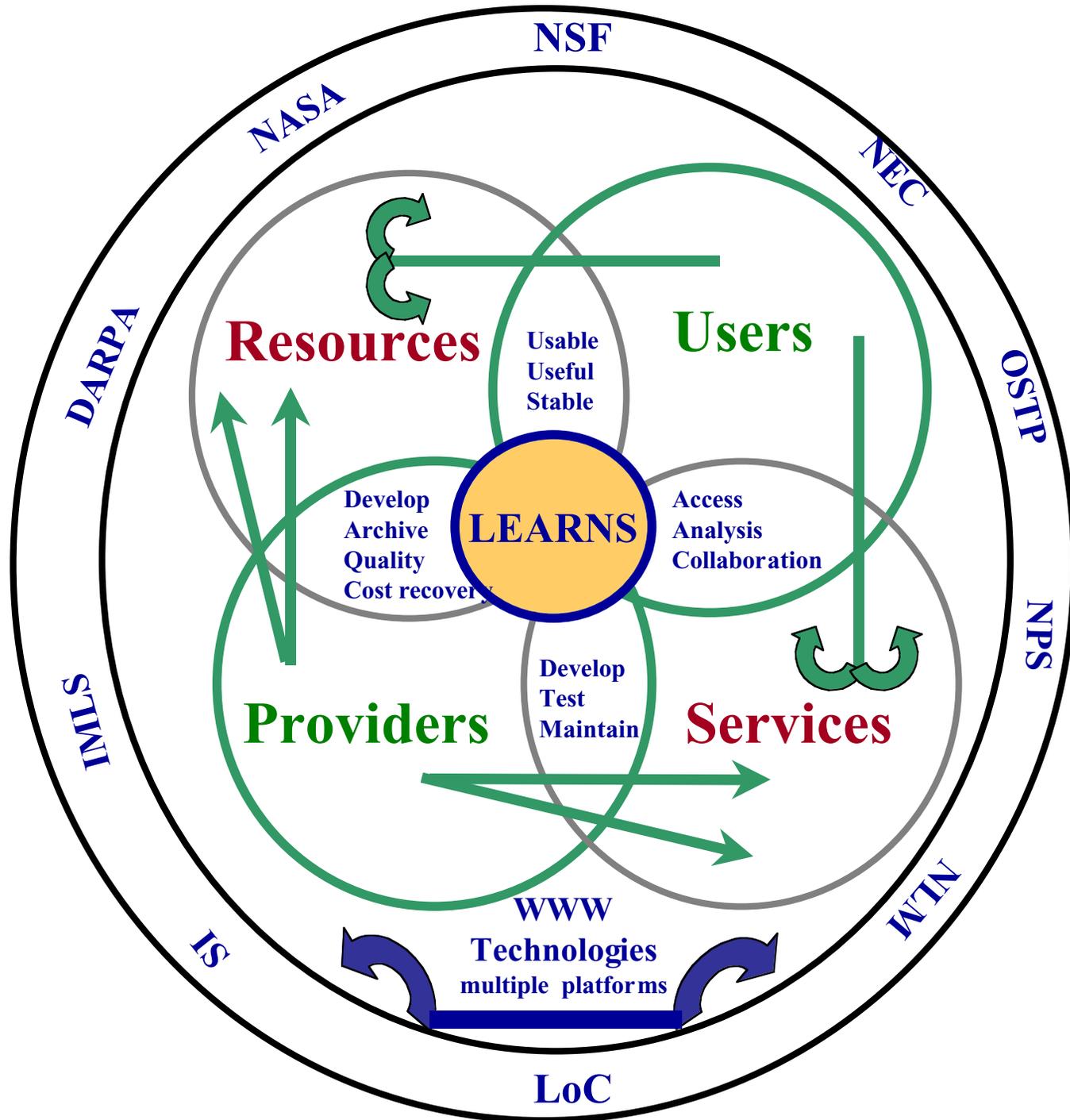
# NSDL Program Solicitation

- <http://www.nsf.gov/cgi-bin/getpub?nsf0044>
- Letters of Intent (optional): March 13, 2000
- Proposal deadline: April 14, 2000
  - Received 86 proposals [7, 42, 30, 7]
- *[due-nsdl-program@nsf.gov](mailto:due-nsdl-program@nsf.gov)* (contact point)
- <http://www.ehr.nsf.gov/EHR/DUE/programs/nsdl/>  
(links to background reports and related projects)





# National Science Foundation



# Core Integration System

- Maintain the premier gateway to the network;
- Supplement and coordinate services developed to enable effective use of and access to the network's content;
- Provide leadership in the development of standards for including resource collections and services in the network;
- Work with resource collection providers to establish a suite of review systems for inclusion of material;
- Coordinate the formulation of requirements — in conjunction with appropriate standards organizations and/or consortia — for interoperability, reusability, reliability, and stability of resources and services;
- Seek out new resource collections to join fully, or otherwise be affiliated with, the library





# Collections

- Identification and aggregation of content
- Classification and cataloging
- Acquisition and/or linking; referencing
- Disciplinary-based themes define a natural body of content, but other possibilities are also encouraged
- Access to massive real-time or archived datasets
- Software tool suites for analysis, modeling, simulation, or visualization
- Reviewed commentary on learning materials and pedagogy



# Services

- Help services, frequently asked questions, etc.
- Synchronous/asynchronous collaborative learning environments using shared resources
- Mechanisms for building personal annotated digital information spaces
- Reliability testing for applets or other digital learning objects
- Audio, image, and video search capability
- Metadata system translation
- Community feedback mechanisms

# Targeted Research

- Digital library usage studies
- Building and sustaining user communities
- Automated annotation of audio, image, or video resources
- Applications of simulation or virtual world technology for virtual assistants
- User interface construction and implementation





# Answers to FAQ

- Collections development not content development
- Pure digitization projects not supported
- End user audience is pre-K to Gray
- Initially, primary content focus is on 13-16 (but program recognizes the rich 11-14 intersection, and the need for the pre-service audience to gain exposure to and experience with K-12 resources; intent is to complement/collaborate with other existing resources, e.g. DOE's Gateway to Educational Materials site, [www.thegateway.org](http://www.thegateway.org))
- Collections/services should answer a national need - How will the collection/service be used, by whom, and why?
- Sustainability important to consider for collections and services
- Attention to metadata issues is vital, awareness of emerging metadata frameworks, e.g. Instructional Management System and Dublin Core (<http://www.imsproject.org/metadata/> or <http://purl.oclc.org/dc/>)
- Markup language issues are also key (<http://www.oasis-open.org/cover/>)