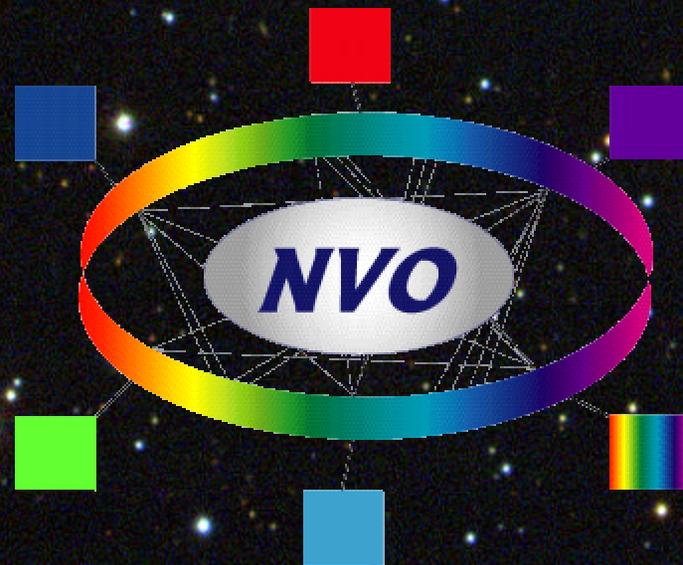


On the Road to a National Virtual Observatory

Presentation to the Joint Meeting of the
SEU and Origins Subcommittees



Robert J. Hanisch
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Baltimore, Maryland
11 July 2001

Genesis of the NVO

- ✍ NAS AASC Decadal Report identifies the National Virtual Observatory as the highest rank small-scale project
- ✍ Workshops held at JHU (fall 1999), NOAO (spring 2000) to initiate planning
- ✍ Ad hoc Interim Steering Committee formed (spring 2000) which wrote White Paper
- ✍ White Paper delivered to NASA and NSF, 31 May 2000
- ✍ “Virtual Observatories of the Future” conference, Caltech, June 2000
- ✍ “Mining the Sky” conference, Garching, July 2000
- ✍ ADASS X conference, Boston, November 2000
- ✍ NASA “Dear Colleague” letter (October 2000)
- ✍ AAS Special Session (January 2001)



✍ “Several small initiatives recommended by the committee span both ground and space. The first among them—the National Virtual Observatory (NVO)—is the committee’s top priority among the small initiatives. The NVO will provide a “virtual sky” based on the enormous data sets being created now and the even larger ones proposed for the future. It will enable a new mode of research for professional astronomers and will provide to the public an unparalleled opportunity for education and discovery.”

—*Astronomy and Astrophysics in the New Millennium*,
p. 14



First Initiatives

- ✍ Interim Steering Committee made decision in fall of 2000 to pursue NVO framework development through the available NSF Information Technology Research program
 - ✍ “Large” program (\$15M over 5 years)
 - ✍ Large astronomy/IT/CS collaboration: 42 collaborators, 16 organizations, 8 international liaisons
 - ✍ Nine education partners
 - ✍ Leverages on similar efforts such as GriPhyN and many IT products/packages
 - ✍ Goal: create the information technology framework and demonstrate select science prototypes



NVO ITR Proposal Team

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Collaborators

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R. Brissenden	SAO	I. Griffin	STScI
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International Liaisons

P. Benvenuti	ST-ECF/ESA	F. Murtagh	U. Belfast
D. Durand	CADC	R. Norris	ATNF
F. Genova	CDS	S. Okamura	U. Tokyo
A. Lawrence	ROE	P. Quinn	ESO

Education Partners

Association of Science-Technology Centers	International Planetarium Society
National Air and Space Museum	Silicon Graphics (Digital Planetarium)
Spitz (Electric Sky)	Maryland Space Grant Consortium
Gettysburg College (Project CLEA)	UC Berkeley (CSE@SSL)
American Museum of Natural History	



We Are Ready to Roll, But There's No Fuel in the Tank...

- ✍ Unfortunately, funding for NVO via the NSF ITR program is doubtful—program is oversubscribed by a factor of ten
- ✍ In any case, NSF funding would not cover full implementation



NASA and the NVO

- ✍ NASA's astrophysics data centers are the cornerstones of the NVO, *but are not sufficient in themselves*
 - ✍ Much effort is required to develop data location and integration services; to enable management of large, distributed archives and catalogs; to support massive cross-correlations; and to provide data visualization and data mining tools
 - ✍ Technical infrastructure—computational services and network bandwidth—needs improvement at primary NVO service sites
 - ✍ NASA programs exist in these areas (e.g., NASA Information Power Grid) but are not currently aligned with NVO initiative



An International VO

- ✍ Several European VO initiatives have been proposed and are now funded
 - ✍ UK: AstroGrid
 - ✍ EU: AstroVirTel, Astronomical Virtual Observatory, AstroWise
- ✍ NVO should be developed in step with these initiatives
 - ✍ Common standards
 - ✍ Shared learning
 - ✍ Open access, international collaboration
 - ✍ Starting late could drive NASA costs significantly higher as complex standards will have been unilaterally set



Ongoing Public Discussion

✍ Conferences

- ✍ Statistical Challenges in Modern Astronomy III, July 2001
- ✍ SPIE Annual Meeting, August 2001
- ✍ JENAM, September 2001
- ✍ ADASS XI, October 2001
- ✍ International VO meeting, Europe, summer 2002
- ✍ IAU Symposium, summer 2003



Summary

- ✍ White Paper suggested that NVO should be joint NSF/NASA enterprise
 - ✍ NVO is inherently a distributed system, and necessarily a distributed effort
 - ✍ NSF could fund IT research and implement archival services for ground-based facilities
 - ✍ NASA roles could include supporting system-level implementation and operation
 - ✍ Both agencies could sponsor “GO” research programs
- ✍ Estimated total development and operations cost over ten years is \$60-70M; like a SMEX
- ✍ How can the NVO be incorporated into NASA’s astrophysics “missions”?



More info...

<http://www.voforum.org>

 White Paper

 Conferences

 Discussion forum