

Kris Stewart

CyberBridge – Summer 2010

Evolution of Computers and Internet as the
background for Ethics

3d Game Programming as Service Learning
for CS students

www.biobridge.us/programs/cyberbridge/who-we-are



<http://www-rohan.sdsu.edu/~tarokh/research/people-kstewart.html>

How does this relate to us today?

(Qwest's High Speed Fiber located on the Railroad Right of Way)

[Network Maps:](#)

Qwest North American Fiber Network

[Press Release](#)

Click on any US or Mexico region to zoom in...



Timeline of Technology (and Stewart's life)

Upd: Jan. 2007/Org: June 2000, SDSU

Thank you for the motivation to reflect on my personal history of life

Date	Technology	Event	Popular Culture	Comments
A Big Picture of timelines			World History : HyperHistory Online navigates through 3,000 years of World History	The Info Scout from the University of Wisconsin is useful to me.
February 14, 1946	ENIAC (U. Pennsylvania)			1997 the Association for Computing Machinery (ACM) celebrates its 50 year anniversary, closely tied to the first computer. ACM is the International Professional Society of computer science.
January 10, 1951		Wendy Christine Beard is born		My father (Lt. Col. W.O. Beard) was at Chosin Reservoir, Korea. The attention paid to this Forgotten War a few years ago reminded me that my 50th birthday came and went.
July 1955		Disneyland Opens in Anaheim		
Spring 1969	ARPAnet is born (UCLA)		Centeniel of Golden Spike Transcontinental Railroad Ref: Irving Stone's "Men to Match my Mountains" (Doubleday, 1956)	Kris Beard is Vista High Graduate, on to UCSD to major in Math
1978	Kris builds Z80 Microcomputer Kit Email: qb30087@calstate.bitnet (CSU Cyber)	SDSU Masters Project	"Pirates of Silicon Valley" TNT Movie describes this era. Perhaps we will critically watch next week.	Numerical Analysis in BASIC, available online from SCRUNCH available from GAMS/NIST
1979	NASA Space Craft (Voyager 1 Encounter) Internet access to email			Stewart joins Mathematical Software team at Jet Propulsion Lab, Pasadena with MS in Computer Science
1981	Math Software with Cleve Moler, University New Mexico (witness to MATLAB birth)			Stewart starts work on the PhD at the University of New Mexico, Albuquerque
1984	Stewart returns to SDSU as Asst. Prof. in Numerical Analysis		Apple Ads (look at 1984 Movie shown during the U.S. Superbowl)	Stewart works to include computing in numerical analysis curriculum at SDSU
1993	NSF funds STEP at the San Diego Supercomputer Center (1993-1997) www.sdsc.edu/GatherScatter/gsfall94/gsfall_a8.html Supercomputer Teacher Enhancement Program STEP [GatherScatter Fall94]			Stewart introduces high school science teachers to computational science through workshops at SDSC.
Spring 1994	Stewart's Web Page first faculty home page at SDSU			STEP teachers jumped onto the use of the WWW
June 2000	Map the Human Genome June 25, 2000 announcement from White House	Cure for MS? Annette Funicello and I sure hope so.	Chronology/Microcomputers 1995-2001 copyright [watch browser's "location" field] Chronology/Microcomputers 1995-2002 copyright [always try to verify your data]	Author (Who?) Who made available? (Where?) Copyright (When?)
PBS explains computers to public	machine that changed the world WGBH, BBC, ACM, NSF, UNISYS	Triumph of the NERDS PBS Bob Cringely	Nerds 2.0.1 PBS Bob Cringely	Atlas of Cyber Spaces Historical Maps of Computer Networks

NSF Celebrates 50 years

NSF National Science Foundation
WHERE DISCOVERIES BEGIN

SEARCH
NSF Web Site

HOME | FUNDING | AWARDS | DISCOVERIES | NEWS | PUBLICATIONS | STATISTICS | ABOUT | FastLane

NSF and the Birth of the Internet

2000 1990 1980 1970 1960

Home 1960s 1970s 1980s 1990s 2000s Resources | Text-only

IN THE BEGINNING
VINT CERF VIDEO >

NSFNET IS BORN
GEORGE STRAWN VIDEO >

MOSAIC PICTURES THE WEB
ERIC BINA VIDEO >

0000000000
Number of Computers on the Net

0000000
Baud Rate

Credits

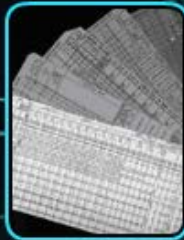
Web Policies and Important Links | Privacy | FOIA | Help | Contact NSF | Contact Webmaster | SiteMap

www.nsf.gov/news/special_reports/nsf-net/



NSF and the Birth of the Internet

1960s



1960s

▶ Sequential Maps of Internet Growth

0000000004

Number of Computers on the Net

00000004000

Baud Rate

Note: 4
computers
Speed 4000 baud





NSF and the Birth of the Internet

1970s



Sequential Maps of Internet Growth

0000000**188**

Number of Computers on the Net

0000000**4800**

Baud Rate



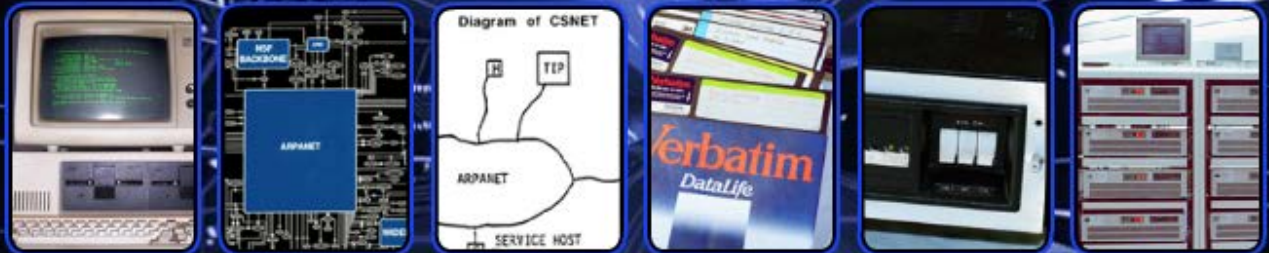
1970s

188 computers
4800 baud

NSF and the Birth of the Internet

1980s

1980s



Home | 1960s | 1970s | **1980s** | 1990s | 2000s | Resources | Text-only

159,000 computers
1,400,000 baud

▶ Sequential Maps of Internet Growth

0000**159000**

Number of Computers on the Net

0000**1400000**

Baud Rate



NSF and the Birth of the Internet

1990s



Home | 1960s | 1970s | 1980s | **1990s** | 2000s | Resources | Text-only

▶ Sequential Maps of Internet Growth

0248000000

Number of Internet Users

0001000000

Baud Rate

1990s

248,000,000 compute
10,000,000 baud

NSF and the Birth of the Internet

2000s



2000s

1.2 G computers
20,000,000,000 baud

[Home](#) | [1960s](#) | [1970s](#) | [1980s](#) | [1990s](#) | **[2000s](#)** | [Resources](#) | [Text-only](#)

 [Sequential Maps of Internet Growth](#)

1200000000

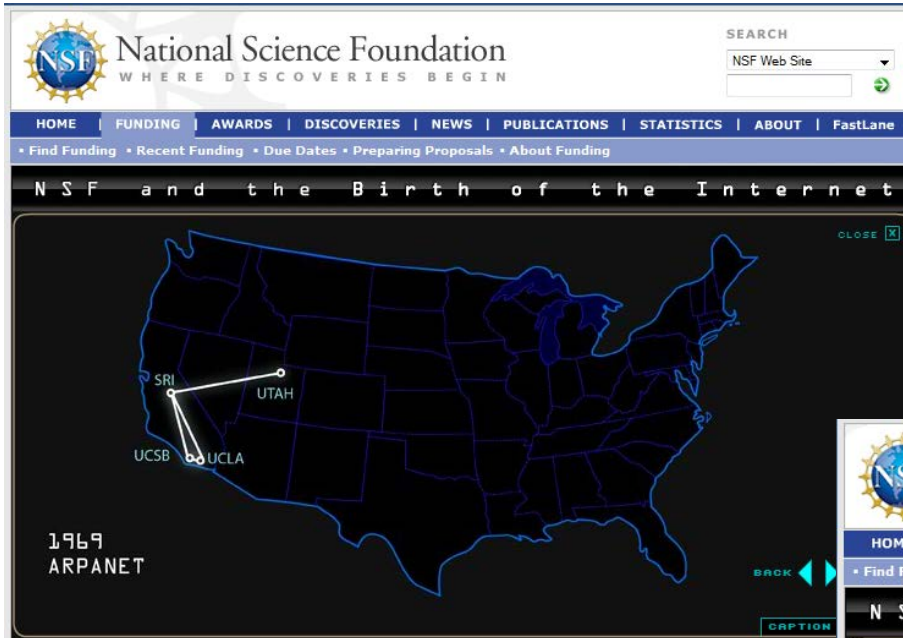
Number of Computers on the Net

20000000000

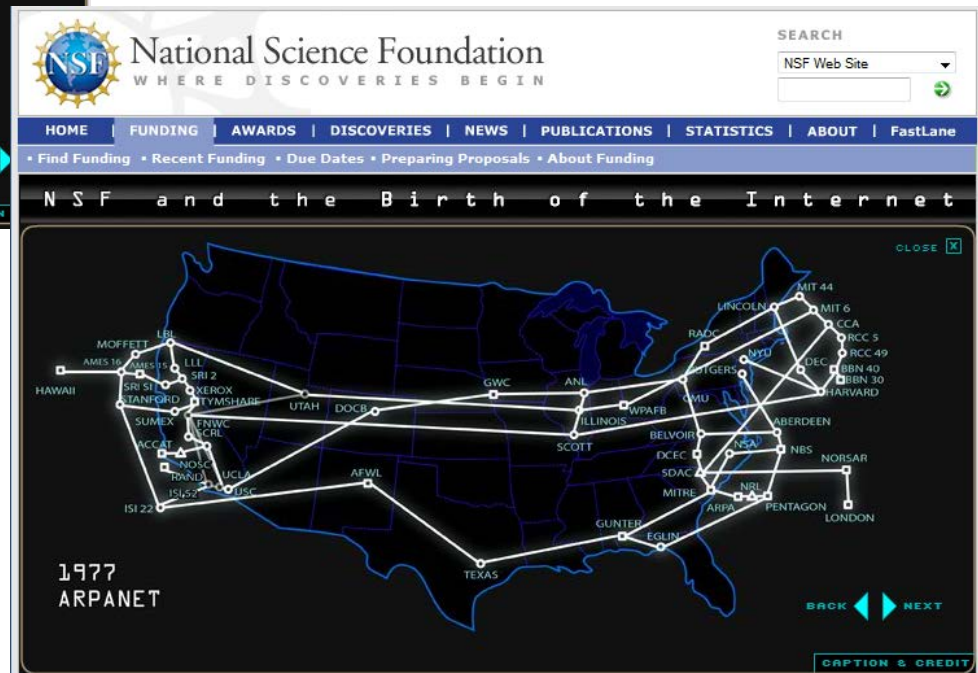
Baud Rate

Evolution of Network-1

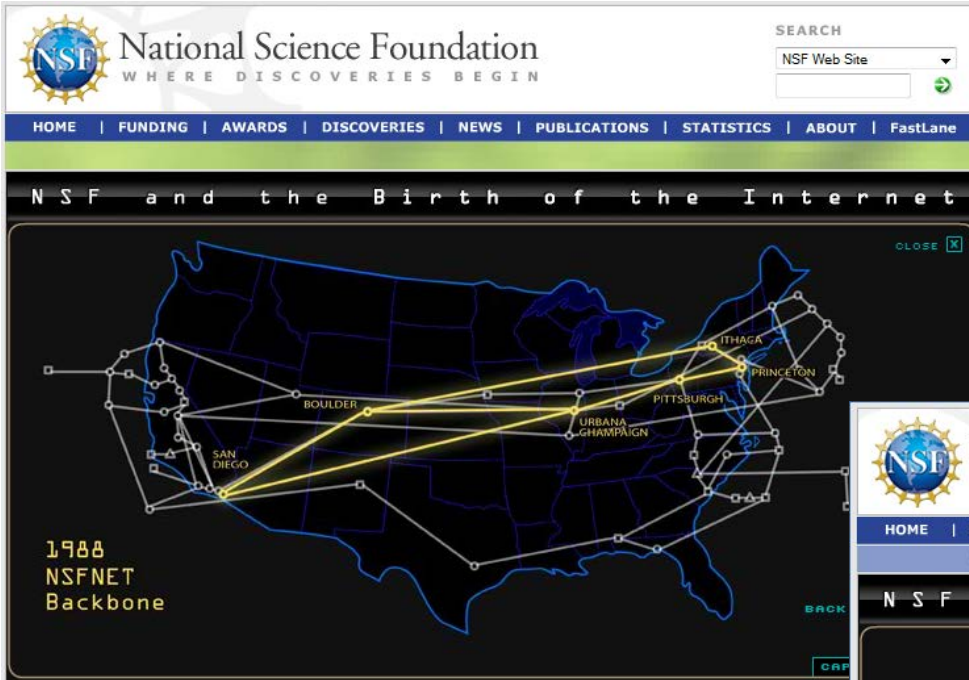
ARPANET 1969



NSFNET 1977

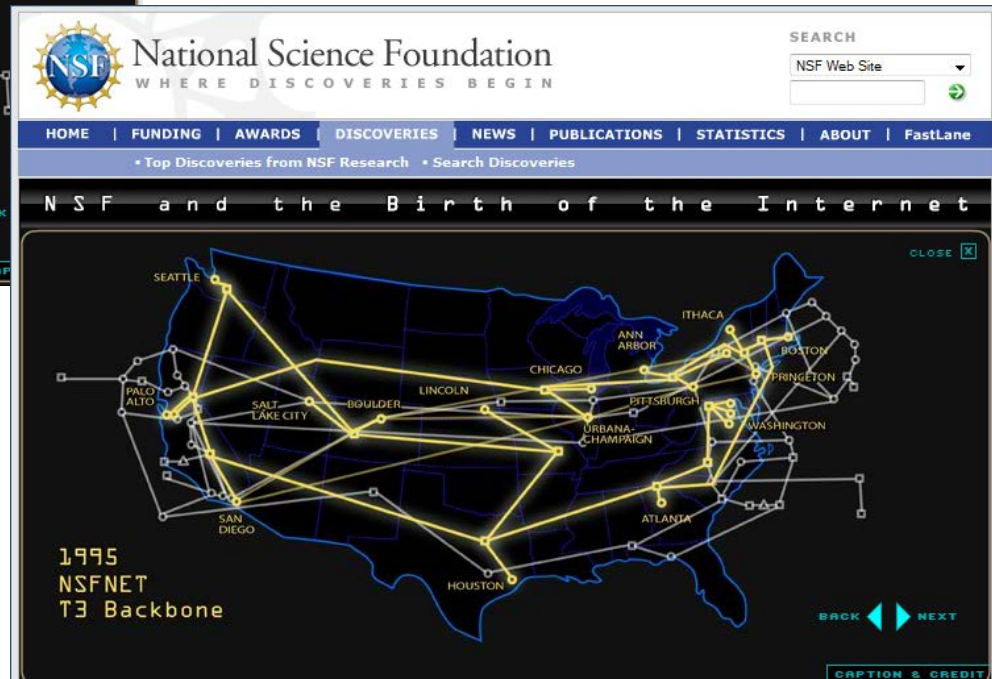


Evolution of Network-2

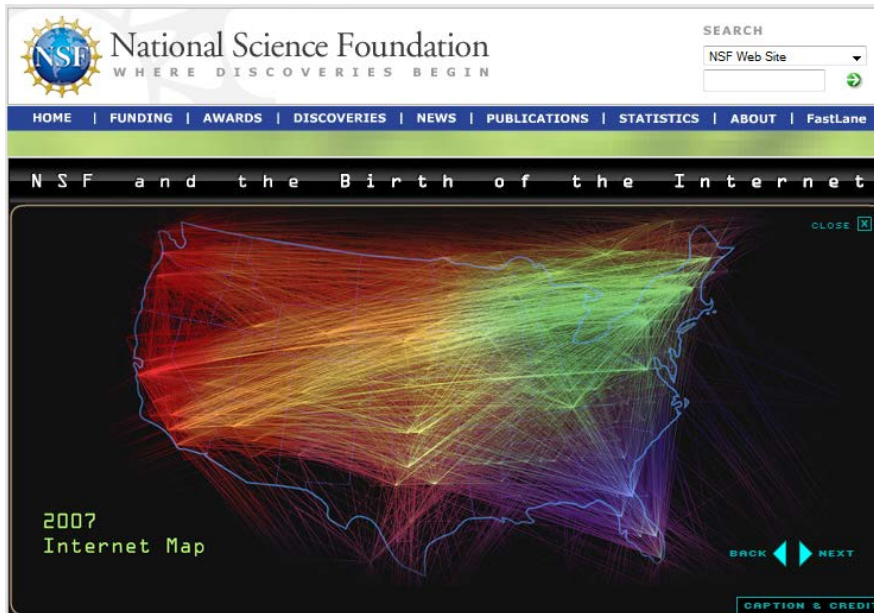


1988 NSFNET Backbone

1995 NSFNET T3 Backbone

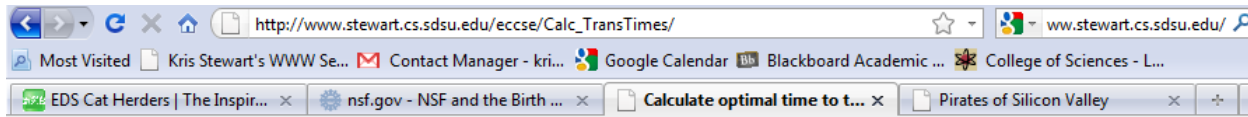


Evolution of Internet-3



2007 Internet Map of US

Calculate Transmit Time for your 1GB HardDrive vs. Network Speed



Enter the size of your hard drive and see the resulting transfer time



Enter file size:

Modem 14.4 Kbps (Kilobits per second)	<input type="text" value="177"/>	hours	<input type="text" value="46"/>	minutes	<input type="text" value="40"/>	seconds
Modem 28.8 Kbps (Kilobits per second)	<input type="text" value="88"/>	hours	<input type="text" value="53"/>	minutes	<input type="text" value="20"/>	seconds
Modem 33.6 Kbps (Kilobits per second)	<input type="text" value="74"/>	hours	<input type="text" value="51"/>	minutes	<input type="text" value="13"/>	seconds
Modem 56.6 Kbps (Kilobits per second)	<input type="text" value="39"/>	hours	<input type="text" value="40"/>	minutes	<input type="text" value="57"/>	seconds
64Kbps ISDN (Integrated Services Digital Network)	<input type="text" value="34"/>	hours	<input type="text" value="43"/>	minutes	<input type="text" value="20"/>	seconds
128Kbps ISDN (Integrated Services Digital Network)	<input type="text" value="17"/>	hours	<input type="text" value="21"/>	minutes	<input type="text" value="40"/>	seconds
T1 1.544 Mbps (Megabits per second)	<input type="text" value="1"/>	hours	<input type="text" value="39"/>	minutes	<input type="text" value="27"/>	seconds
T3 45 Mbps (Megabits per second)	<input type="text" value="0"/>	hours	<input type="text" value="3"/>	minutes	<input type="text" value="26"/>	seconds
OC1 52 Mbps (Megabits per second)	<input type="text" value="0"/>	hours	<input type="text" value="2"/>	minutes	<input type="text" value="57"/>	seconds
OC3 155 Mbps (Megabits per second)	<input type="text" value="0"/>	hours	<input type="text" value="0"/>	minutes	<input type="text" value="52"/>	seconds
OC12 622 Mbps (Megabits per second)	<input type="text" value="0"/>	hours	<input type="text" value="0"/>	minutes	<input type="text" value="13"/>	seconds

For Your Information:
 Megabit: About one million bits. Exactly 1,048,576 bits (2^{20}).
 Kilobit: About one thousand bits. Exactly 1024 bits (2^{10}).
 Bit: Smallest unit of data in a computer. A bit has a single binary value, 0 or 1.

Written by [Jerry Kuzminsky](#).

Stewart Background / Refs

- 1973 BA Math UCSD (unsuccessfully UCB PhD)
- 1976-79 MS Computer Science SDSU (Imsai 8080/Z80 microcomputer kit)
- 1979-81 Jet Propulsion Lab, Pasadena Ca
- 1981-87 UNM PhD Applied Math/CS
- 1984 hired SDSU Numerical Analyst faculty
- 1993-96 Supercomputer Teacher Enhancement Program (SD High Schools with SDSC resources)
- 1995 HPC at SDSU with SDSC resources
- 1997-2006 NPACI (HPC at CSU with SDSC/net resources)
- 2005 Engaging People in CyberInfrastructure (EPIC) using Game Engines as Curriculum Tool

UCSD=U.California, San Diego, SDSU=San Diego State U., UNM=U.NewMexico,
HPC=High Performance Computing, SDSC=San Diego Supercomputer Center,
NPACI=National Partnership for Advanced Computational Infrastructure


Curriculum Development

- SUE (Supercomputing and Undergraduate Education) workshop for CSU faculty 1990-93
- STEP (Supercomputer Teacher Enhancement Program) workshops for High School Teacher Teams 1993-96
- NPACI (National Partnership for Advanced Computational Science Infrastructure) 1997-2005
- KUCSEC (Keck Undergrad Computational Science Education Consortium) 2002-2006
- EPIC (Engaging People in Cyberinfrastructure) using Game Engines in University Undergrad Curriculum 2005-07

Key Points in video for Modern Computer History

- **1984 Superbowl commercial announcing Apple Macintosh** [http://en.wikipedia.org/wiki/1984_\(advertisement\)](http://en.wikipedia.org/wiki/1984_(advertisement))
- **Pirates of Silicon Valley [TV movie]**
http://en.wikipedia.org/wiki/Pirates_of_Silicon_Valley
- **The Machine That Changed the World [TMTCTW] BBC & PBS**
http://waxy.org/2008/06/the_machine_that_changed_the_world/
- **Triumph of the Nerds PBS Bob Cringely**
<http://www.pbs.org/nerds/>
- **Nerds 2.0.1 Bob Cringely, PBS**
http://www.stewart.cs.sdsu.edu/cs440/nerds_2_0_1.html
- **CatHerders Superbowl commercial**
http://www.computerworld.com/s/article/print/9152078/Top_10_Super_Bowl_tech_ads?taxonomyName=Hardware&taxonomyId=12

Superbowl Commercials from Tech Companies (over time)

My choices are 1984 (Apple Macintosh premier, directed by Ridley Scott and EDS Cat Herders )

Xerox: "Monks" (1976)

Apple: "1984" (1984)

Intel: "Play That Funky Music" (1997)

CompuServe: "Not Busy" (1997)

Lotus: "Capitalism" (1997)

lomega: "Bermuda Triangle" (1998)

Network Associates: "Missile Silo" (1998)

EDS: "Cat Herders" (2000)

Computer Associates: "Amnesia" (2002)

Garmin: "Napoleon" (2008)

Online Resources (a moving target)

- What criteria to use to evaluate? (date, biases, focus, intended audience, how supported ...)
- Anything from ACM (Association for Computing Machinery)
- Research and Documentation in the Electronic Age – Diana Hacker
<http://dianahacker.com/resdoc/>
- **Scout Report** Results. Solutions. Knowledge.
Since 1994, the Internet Scout Project has focused on research and development projects that provide better tools and services for finding, filtering and delivering online information and metadata.
<http://scout.wisc.edu/>

Students need to question web resources – much is invalid

- Research and Documentation in the Electronic Age – Diana Hacker
<http://dianahacker.com/resdoc/>
- Campus Infrastructure – SDSU Reference Librarians provide guidance:
- Evaluating Sources of Info:
<http://infodome.sdsu.edu/research/evaluate/evaluate.shtml>

What resources do you have in your school?
How much support for you (teacher) and your students?

My Favorite online resources

- Scout Report (weekly email and archives)
- ACM Tech News (3 times/wk & archives)
- WayBack Machine
- Wikipedia – how to use effectively. Point out to students its View History [alt-h]

Resources found on web can be included, if acknowledged correctly

- Avoid Plagerism charges (cheating)
- Respect Copyright and other individuals Intellectual Property (IP)
- It is the “right thing to do” (cultural differences)

Programming for Middle- and High-school

The screenshot shows the NASA Jet Propulsion Laboratory website interface. At the top left is the NASA logo and the text "Jet Propulsion Laboratory California Institute of Technology". To the right is a link "+ View the NASA Portal". Below this is a navigation bar with tabs for "JPL HOME", "EARTH", "SOLAR SYSTEM", "STARS & GALAXIES", and "TECHNOLOGY". The main heading is "JPL Virtual Field Trip". The central content area features a "MISSION CONTROL" window with a video of a mission control room. Text reads: "Welcome to NASA's Jet Propulsion Laboratory", "Do you want to be a space explorer? Take our tour to find out how we explore space!", and "First choose a 'face' below and then click on it to join the tour." Below this text are five avatars: a purple alien, a blonde woman, a young boy, a man with glasses, and a woman with brown hair. At the bottom of the page are links for "PRIVACY / COPYRIGHT", "FREQUENTLY ASKED QUESTIONS", and "FEEDBACK". The footer includes the "FIRST GOV" logo, a link to the Freedom of Information Act, the NASA logo, and contact information for Site Manager Susan Watanabe and Webmasters Tony Greicius and Martin Perez. It also states "This site is developed by Numedeon, Inc."

Computer Science Teachers Association

<http://www.csta.acm.org>

Dec 5-11, 2010 Computer Science Education Week (CSEdWeek)
U.S. Congress



References

- **SUE** <http://portal.acm.org/citation.cfm?id=224209>
- **STEP** <http://www.stewart.cs.sdsu.edu/SC97/>
- **NPACI** <http://www.sdsc.edu/pub/envision/v14.1/edcenter.html>
- **KUCSEC** <http://www.stewart.cs.sdsu.edu/KUCSEK/>
- **EPIC** <http://portal.acm.org/citation.cfm?id=1516586>
- **CyberBridge** http://www.scivee.tv/tag/kris_stewart
- **CSTA** <http://www.csta.acm.org>
- **Wayback Machine**
http://www.stewart.cs.sdsu.edu/step/wayback_machine.html
- **Scout Report** <http://scout.wisc.edu/>
- **ACM Tech News** <http://technews.acm.org>

What resources do you have at your school?

- What resources?
- What technical support?
- What policy restrictions on use of the Internet?
- What interests you?
Responsible Internet Usage
Computer Games and Programming

The Scout Report

An Internet Scout Publication. Sponsored by University of Wisconsin - Madison Libraries

Best of 2009-2010

June 10th, 2010

The Internet Scout staff takes an incredible amount of pride in providing pointers to some of the best online resources to our readers in our weekly Scout Report. Although we feel all of the resources we cover are valuable, inevitably there are some that stand out from the pack. In this year's 'Best of' issue we will share some of our favorite sites from the past academic year with our readers. The process of choosing which sites to include was not easy, as the interests of our staff vary as much as those of our readers. Whether it is the design of the site, the fascinating subject area and content, the site's ease of use, or its usability in the classroom, Scout staffers all have different rationale for preferring one online resource over another. Nevertheless, we were able to produce a top ten list that pleased everyone on the staff and we hope our readers as well.

The list is not intended to be inclusive of all our favorites, or every great resource, but it is meant to remind our readers of some of the outstanding resources the Scout Report has covered over the past academic year. So we hope you enjoy this list, and maybe take a few minutes to revisit some of our favorite sites from 2009-2010. As always, we look forward to providing you with a new batch of fantastic resources throughout the upcoming year.

In This Issue

Best of 2009-2010

- [Xeno-Canto: Bird Sounds From the Americas \[Real Player\]](#)
- [Nasa eClips](#)
- [Vincent Van Gogh: The Letters](#)
- [Exploratorium 40th Anniversary: Speaking of Music Rewind \[iTunes\]](#)
- [National Science Foundation: Science Nation \[Flash Player\]](#)
- [The Mathematical Association of America: Podcast Center](#)
- [Balzac's Paris: A Guided Tour](#)
- [BioEd Online: Podcasts Plus Lessons](#)
- [HistoryWorld](#)
- [Nature Milestones](#)

Informed Citizenry

HUMANKIND
Voices of Hope and Humanity
Written and Produced for Public Radio by DAVID FREUDBERG

HOME • HOW YOU CAN HELP • ABOUT HUMANMEDIA.ORG • SEND US AN EMAIL • FAQ'S • YOUR ACCOUNT • July 5, 2010

MP3 Sale:
\$4.95
(limit 3 at this price)

Find a program by guest, # or category
Search

Category Index

- Breaking Down Barriers
- Cancer Prevention, Survival
- Community Service/Charity
- Educating the Whole Person
- History
- Human Rights
- Humanizing Health Care
- Journey thru the Lifecycle
- Lifting Up Those In Need
- Managing Your Stress
- Meaningful Media
- Natural Health
- Peacemakers
- People Who Inspire
- Perspectives In Business
- Protecting Our Planet
- Simplifying Our Lives
- Social Conscience
- Solving Alcohol/Drug Problems
- Spiritual Practices
- Spiritual Teachers, Communities
- Strengthened by Challenge
- Taking Care of Yourself
- Wisdom Stories, Proverbs, Sayings
- Young Voices

Series Index

- Humankind
- Kindred Spirits
- Public Radio Shows
- Special Packages
- Walking through the Storm

Information

- About Humanmedia.org
- About the Producer
- Shipping and Returns
- How You Can Help
- MP3 Troubleshooting
- Listen to our Podcast
- Podcast: More Information
- Conditions of Use
- Copyright
- Website Mount

An Informed Republic



The role of an educated citizenry in our democratic society, as intended by America's founders — and viewed in today's information age

On the founding of the United States: "It wasn't going to be on autopilot. It required direct citizen participation. And I think there were many at the time who thought that it was an experiment that couldn't succeed. That self-rule was very unlikely in a society as diverse as what was happening in this country, with people coming from various places in the world and, as it turned out, a very geographically large country to be in. So there were lots of doubts about how it would work. It was clear I think very early in the United States that it was necessary to have some form of getting our citizens informed about the structure of government, and how citizens could participate and be part of it. That was essential."

--Justice Sandra Day O'Connor (ret.)
United States Supreme Court In Interview with David Freudberg

http://www.humanmedia.org/catalog/player/playsingle.php?f=excerpts/151_informed_republic_1.mp3

Large set of curricula at related site

<http://www.icivics.org/>

Addresses journalism vs. "local TV news" as a source of information and the "fall of newspapers"

http://www.stewart.cs.sdsu.edu/step/wayback_machine.html

File Edit View Favorites Tools Help

Google ceili irish name Search Share Sidewiki

10aug2007_re... BC Ferries - Br... Mr. Peabo... http://cohofe...

Mr. Peabody and his boy Sherman WayBack Machine by Kris Stewart

Upd: 29May2010

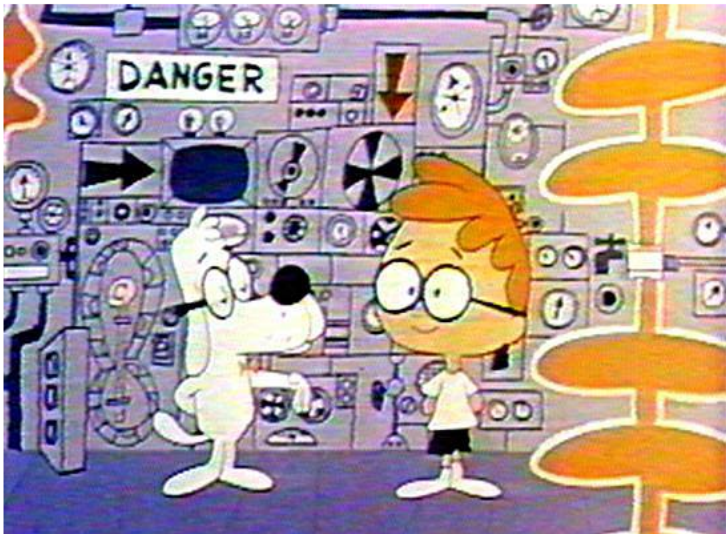
The www.archive.org/, WayBack Machine

The WayBack Machine, is an Internet archive that keeps track of "the internet" in its entirety, by year. By entering a URL, you may find web page that you remember "used to be there" but is "unfound" now.

[en.wikipedia.org/wiki/The Rocky and Bullwinkle Show](http://en.wikipedia.org/wiki/The_Rocky_and_Bullwinkle_Show) [wikipedia]

Kris Stewart (formerly [Wendy Beard](#)) is a big fan of the cartoon [Rocky and Bullwinkle](#). I always liked Bullwinkle best, Rocky was just too goody-two-shoes for me. Second best was Dudley Do Right of the Mounties. I guess I was destined to marry a Canadian, eh?

[en.wikipedia.org/wiki/Mister Peabody](http://en.wikipedia.org/wiki/Mister_Peabody) was created by Ted Key.



Mr. Peabody and his boy Sherman in front of the WayBack Machine preparing for another Peabody's **Improbably History** adventure.

URL indicates the Wayback Machine

STEP Participants

[Ana Alvarez](#)

Counselor at [Hoover High School](#)

[Don Anderson](#)

UCSD faculty, STEP Principal Investigator

[Bobbie Ball](#)

Chemistry Teacher at Bonita Vista High School

[Steve Bartram](#)

Marine Science Teacher at [Rancho Buena Vista High School](#)

[Diana Bentley](#)

Biology Teacher at Mira Mesa High School

[Peter Burrell](#)

Math Teacher at [Scripps Ranch High School](#)

[John Cavanaugh](#)

Physics and Chemistry Teacher at San Pasqual High School

[Hal Cox](#)

Physics & Chemistry Teacher at [Hoover High School](#)
STEP Lead Teacher

[Susan Crandall](#)

Biology Teacher at Escondido High School

[Olin Elliott](#)

Math teacher at Mountain Empire High School
STEP Lead Teacher

[Mark Falvo](#)

Math, Chemistry & Physics Teacher at [Morse High School](#)

[Lynne Gordon](#)

Biology Teacher at San Diego High School

[Dave Harlow](#)

Computer Teacher at [Gompers Secondary School](#)
STEP Lead Teacher

[Barton Hays](#)

Biology and Marine Science Teacher at [Morse High School](#)

[Henry Herms](#)

Earth Science Teacher at LaCosta Canyon High School

[John Hoang](#)

Math Teacher at [Hoover High School](#)

[Jay Klopfenstein](#)

Biology Teacher at Valley Junior High

[Susan Lafo](#)

Chemistry Teacher at Mountain Empire High School

[Jeffery Mandrake](#)

Science Teacher at [Gompers Secondary School](#)

[Jay Maness](#)

Chemistry Teacher at Southwest High School

[Joe Murray](#)

Physics and Physical Science Teacher at Oceanside High School.

[Robert North](#)

Chemistry Teacher at [Hoover High School](#)

[Andres Parra](#)

Math and Environmental Science Teacher at Mar Vista High School

[Isabel Pereira](#)

Mathematics teacher at [Denbigh High School](#).

[Paul Pucci](#)

Math and Computer Applications Teacher at [Scripps Ranch High School](#)

[Chesley Ross](#)

Biology Teacher at Escondido High School

[Cheri Rossi](#)

Biology Teacher at Morse High School

[Michael Sixtus](#)

Chemistry Teacher at Mar Vista High School

[Larry Steinbrecher](#)

Physics Teacher at Mira Mesa High School

[Kris Stewart](#)

Associate Professor of Mathematical Sciences at [San Diego State University](#)

STEP Curriculum Coordinator

Home Page on [SDCC14 at UCSD](#)

[Tim Towler](#)

Biology Teacher at [San Diego High School](#)

STEP Lead Teacher

Home Page on [SDCC14 at UCSD](#)

[Tien Trieu](#)

Math Teacher at [Hoover High School](#)

[Phill Vanderschaegen](#)

Biology Teacher at San Pasquel High School

[Steve Wavra](#)

Biology Teacher at [Southwest High School](#)

[Anna Wilder-O'Neil](#)

Chemistry Teacher at LaCosta Canyon High School

[Karen Woodworth](#)

Chemistry teacher at Ramona High School

[Roger Wynn](#)

Science Teacher at Mountain Empire Junior High

[Bob Zakoski](#)

Chemistry and Computer Science Teacher at San Dieguito High School and UCSD
STEP Lead Teacher

[Paul Zeigler](#)

Physics Teacher at Carlsbad High School.

Last Updated July 19, 1996 by Tim Towler