

**Information Technology
Laboratory**

NIST
National Institute of
Standards and Technology

Supporting the information technology industry with measurements, standards, and research...

Information Technology Laboratory

Dr. Susan Zevin
Acting Director




March 2003

Outline


- The Organization
- The Environment
- Some ITL Programs
- The Resources


The Organization


ITL Organization


 <p>ACTING DIRECTOR SUSAN ZEVIN</p>	<p>ACTING DEPUTY DIRECTOR KAMIE ROBERTS</p>
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<p>ASSISTANT DIRECTOR FOR BOULDER JACK WANG, ACTING</p>	<p>LABORATORY STAFF KAMIE ROBERTS</p>	<p>SENIOR MANAGEMENT ADVISOR KENDRA COLE</p>
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<p>MATH</p>  <p>RON BOISVERT</p>
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<p>NETWORKING</p>  <p>DAVID SU</p>
--

<p>COMPUTER SECURITY</p>  <p>ED ROBACK</p>
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<p>INFORMATION ACCESS</p>  <p>MARTY HERMAN</p>

<p>CONVERGENT INFORMATION SYSTEMS</p>  <p>VICTOR MCCRARRY</p>

<p>SOFTWARE TESTING</p>  <p>MARK SKALL</p>
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<p>STATISTICS</p>  <p>NELL SEDRANSK</p>



INFORMATION
TECHNOLOGY
LABORATORY

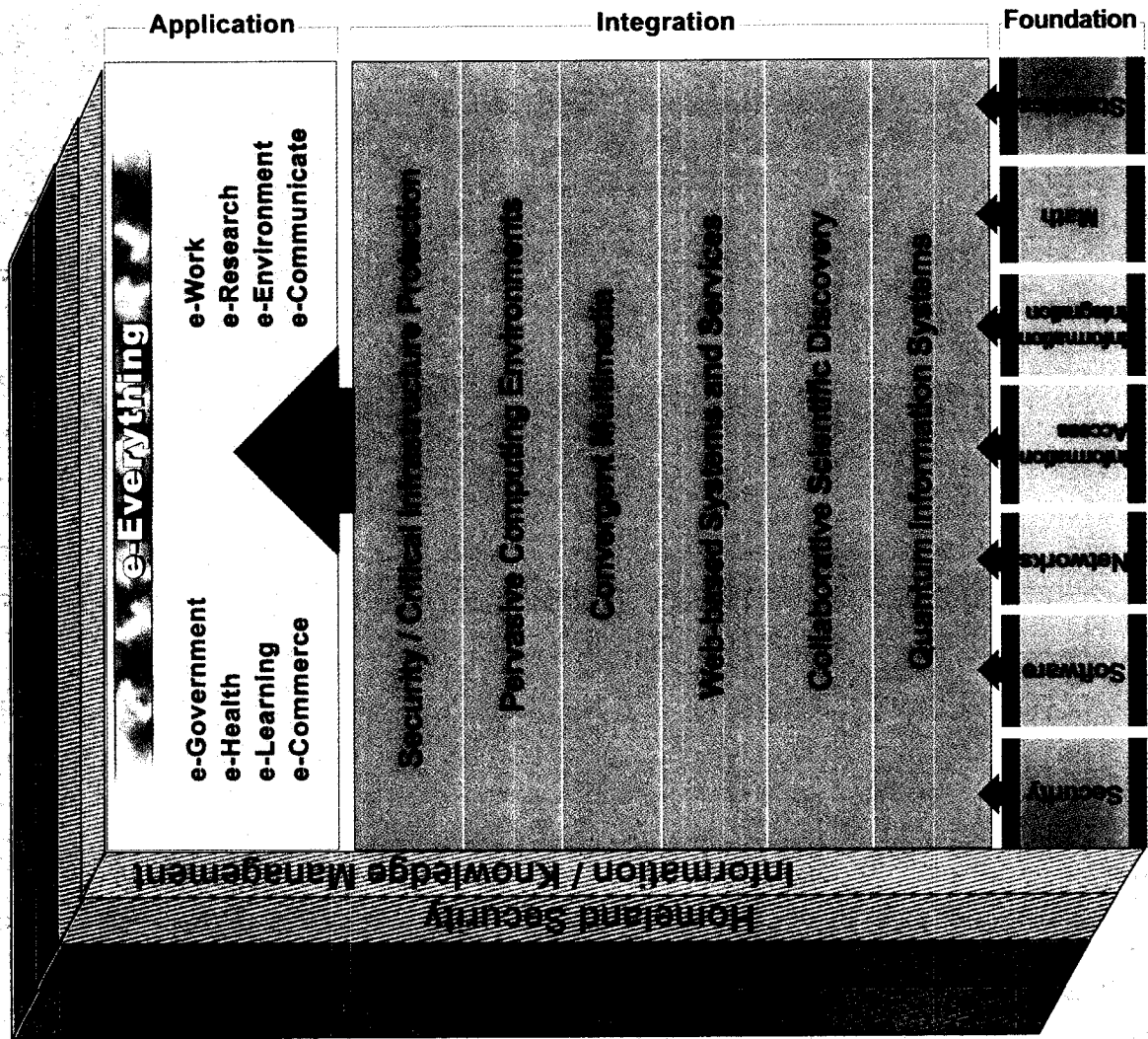


The Environment

ITL Mission

To develop and promote measurement science, standards, and technology for information technology in order to enhance productivity, facilitate trade, and improve the quality of life.

ITL Research Blueprint



What We Hear – Recurring Themes

New demands
for information
assurance

Need to enhance
voting system
integrity

Health care data and
IKM: critical to the
future of the U.S.
medical system

Cyber Security needs
are paramount in the
war on terrorism.

The next revolution:
nano- and quantum
technology; high-end
computing

Pervasive
computing
environments
will be
increasingly
utilized

Virtual labs and new
physical constructs:
modeling and simulation

Biometrics standards:
to ensure homeland
security and privacy

Competencies

Selected Competencies:

Networks and Communications

- Service discovery
- Self-healing networks
- Agile switching
- Internet Infrastructure Protection
- Wireless Ad Hoc Networking

Information Access and Usability

- Retrieval
- Interoperability
- Human language
- Multimedia technologies

Software

- XML Conformance
- Computer forensics
- Electronic commerce
- Test method research

Cross Cut

- Biometrics
- Quantum
- Pervasive
- Healthcare

Security

- Critical Infrastructure Protection
- Encryption standards
- Cryptography
- Security Management
- Security Testing

Mathematics and Statistics

- Key comparisons
- Applied mathematics
- High performance computing
- Visualization
- Process characterization
- Bayesian metrology

Convergence of hardware and software

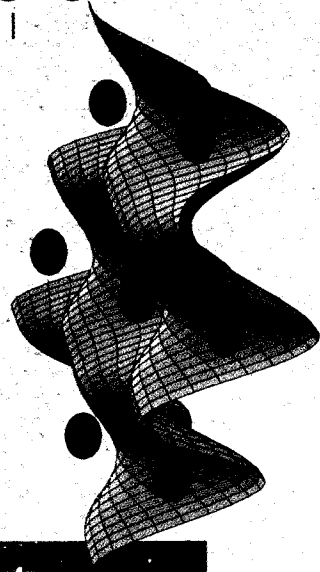
- Content storage
- Content encapsulation

Some ITIL Programs

Quantum Information Systems

Divisions 891, 892, 893, 895, 897, 898, PL, and EEEL

- Quantum Communications Testbed
 - Developed testbed facility for technology assessment, integration
 - Devised protocols for cryptographic key exchange, authentication
- Quantum Computation
 - Investigating low-level quantum state, device modeling
 - Modeling and analyzing programmable gate implementations, error propagation
 - Developing architectures for complete quantum computer systems
 - Continued algorithm development, analysis



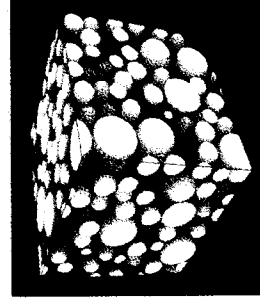
Modeling and Simulation

Divisions 891, 898 with all Laboratories

- Expansion of RAVE immersive visualization facility
- Developing a toolkit for immersive visualization
- Developed 3D version of OOMMF micromagnetics modeling software
- Developed OOF2 for materials microstructure analysis
- Developing state-of-the-art time series models for network traffic simulation
- Developing statistical modeling and tools for network performance, visualization, and anomaly detection



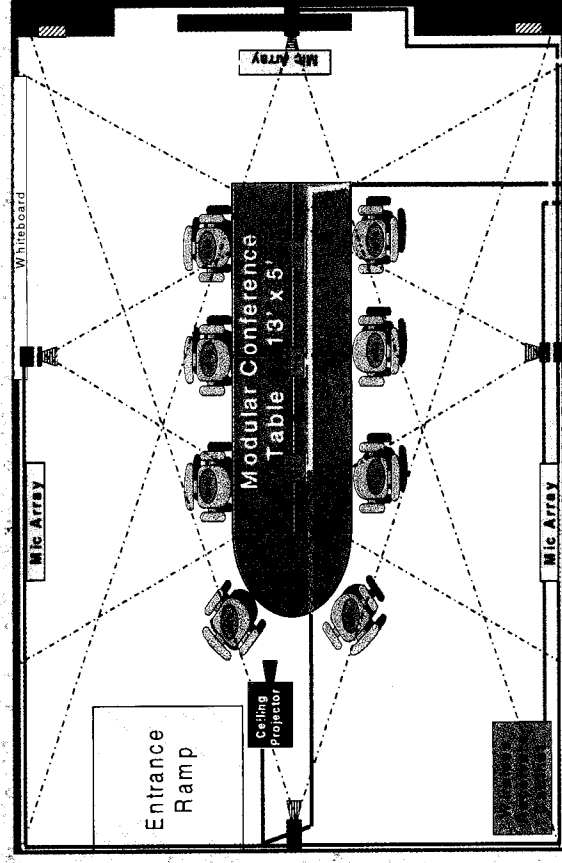
Modeling of aggregates for more realistic computations and visualization



Pervasive Computing

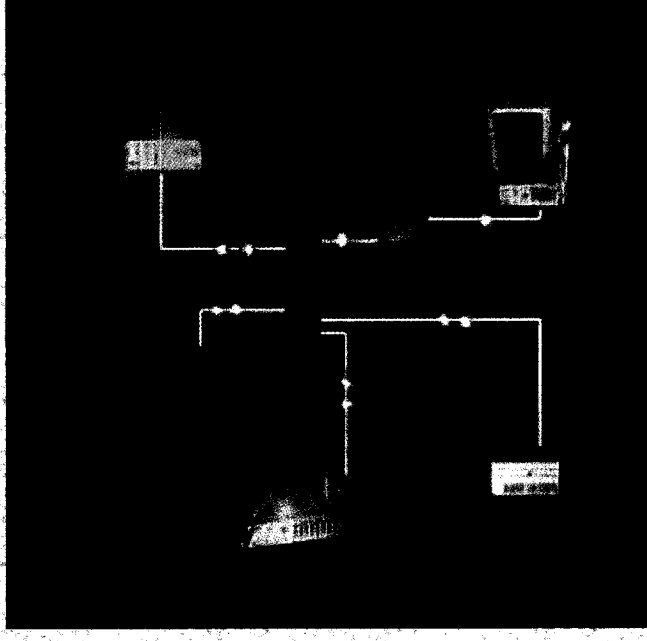
Divisions 892, 893, 894, 897

- Installed new microphone array in smart space
- Integrated face recognition and speaker identification
- Investigated consistency conditions in Jini and UPnP
- Redesigned the Existential Simulation Tool around XML
- Produced recommended practices document on coexistence
- Developed generic model for service discovery protocols
- Adapting Smart Flow system for Single Molecule Manipulation
- Analyzing robustness of Service Discovery Protocols during node failure



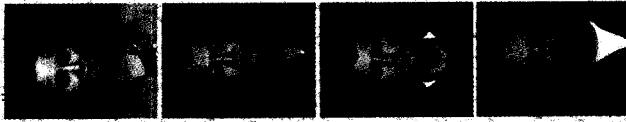
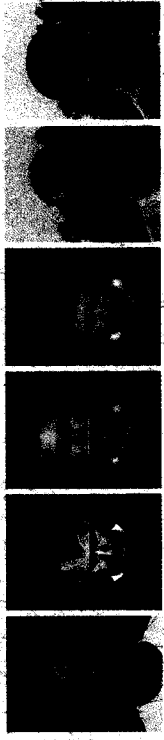
IT Security

- NIST's mandates:
 - Computer Security Act
 - Cyber Security Research and Development Act
 - Federal Information Security Management Act (FISMA)
- NIST's activities:
 - Cryptographic standards and applications (Advanced Encryption Standard)
 - Security testing and validation (National Information Assurance Partnership)
 - Guidelines, procedures, and best practices for federal and private sector IT security
 - Federal Information processing standards
 - Computer Security Expert Assist Team (CSEAT)



Biometrics

Divisions 894, 895, 898



- USA PATRIOT Act and Enhanced Border Security Act
 - Report to Congress
 - Developed measures to allow certification of systems for entry/exit programs
 - Obtained copies of large-scale data sets
 - Completed initial testing with face and fingerprint
- Human Identification at a Distance (HumanID)
 - Analyzed viability of gait as a biometric
- Criminal Justice Information System(CJIS)
 - Completed NIST Fingerprint Image Software
 - Installing FBI's IAFIS-based algorithm test bed
- Enabling Industry Development
 - BioAPI approved as ANSI/INCITS 358-2002
 - Fernando Podio named Chair of INCITS M1 Biometrics Technical Committee

Healthcare

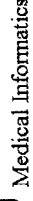
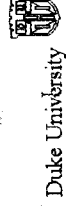
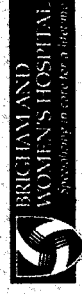
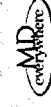
Divisions 892, 893, 894, 895, 897

Clinical Applications

- Developing:
- Healthcare standards roadmap
 - Healthcare standards conformance testing project with HL7
 - Profile development and conformance advisory project
 - Security guidance for healthcare systems
 - Mobility protocols for a healthcare infrastructure

Scientific Discovery

- ITL leadership role in health care standards
- Biomedical Information Science and Technology Initiative Consortium (BISTIC) workshop and follow-up
- Outreach to NIH (e.g. Post Docs)



UNITED STATES

National Library of Medicine



Voting System Standards

ITL, MEL, TS, OD

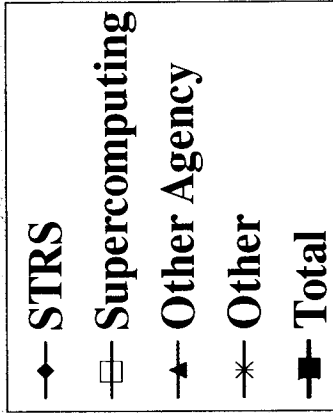
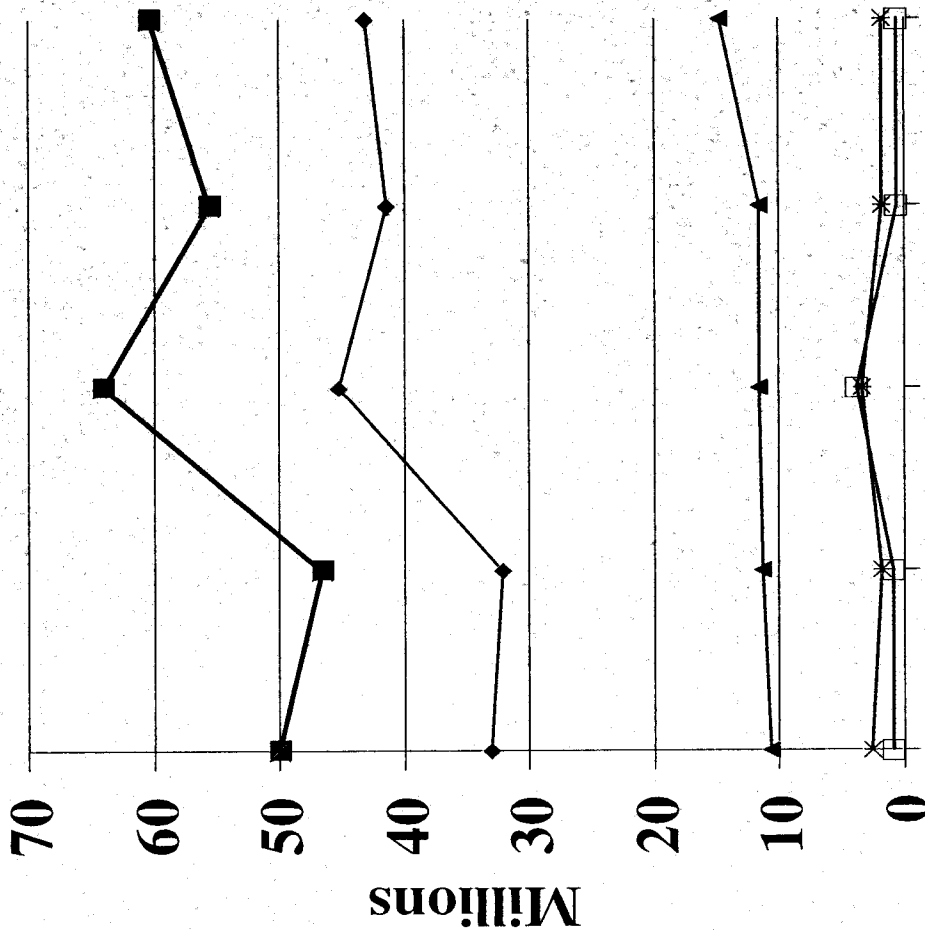
- Chair the Technical Guidelines Development Committee (TGDC)
 - Grants program for
 - Research on voting technology improvements
 - Pilot Programs for testing of equipment and technology
 - Human Factors Report
 - Laboratory accreditation
- Develop intramural R&D program to include, but not limited to research in
 - Security of computers, networks, and data storage
 - Methods to detect and prevent fraud
 - Protection of voter privacy
 - Role of human factors in the design and application of voting systems
 - Remote access voting, including through the Internet



The Resources

ITL Funding Trends for Research

(As of 03/03/03)



Additional Authorizations

- Cyber Security R&D Act
 - FY03 = \$32.7M growing to \$93M in FY07
- FISMA
 - FY03-07 = \$20M annually

FY1999 FY2000 FY2001 FY2002 FY2003