

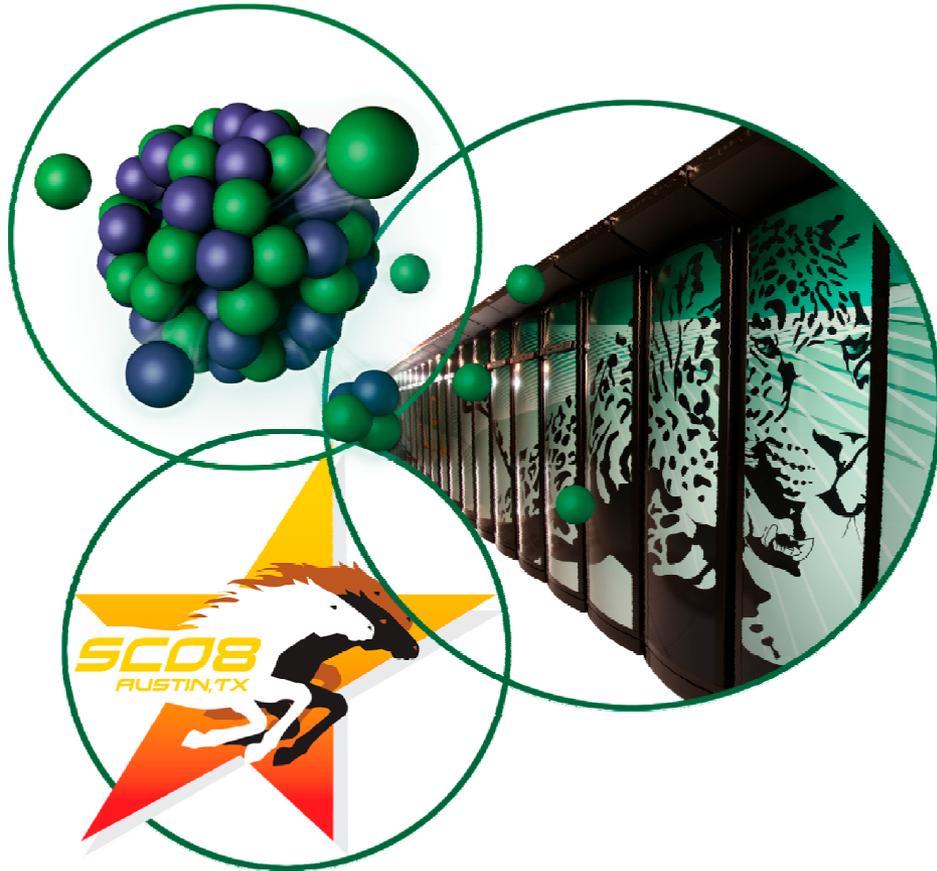
Electronic Laboratory Notebooks

Key to scientific records and project notes

Presented by

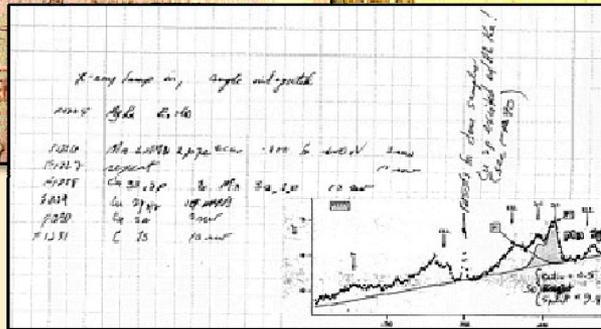
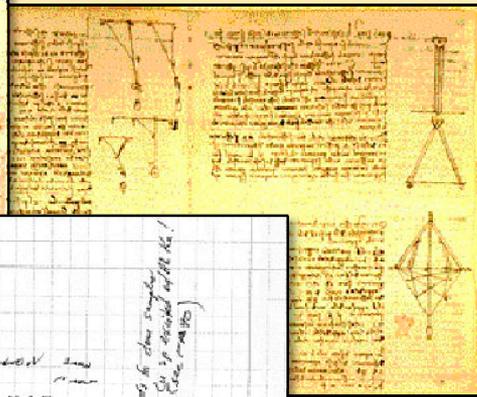
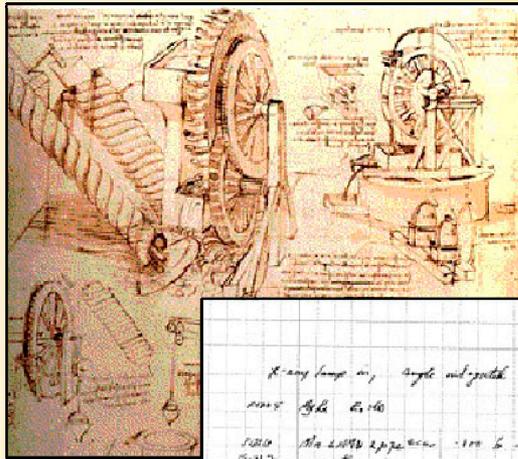
AI Geist

Computer Science Research Group
Computer Science and Mathematics Division



Motivation for notebooks

Laboratory notebooks are the heart of scientific research

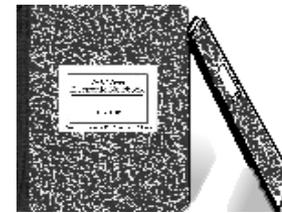


Used in many different ways

- Personal notebook
- Project notebook
- Instrument log book
- Design notebook
- Experiment log book
- Record keeping
- Regulations

Notebook is a chronological record of ideas, data, and events

ORNL electronic notebook



Shared electronic notebook

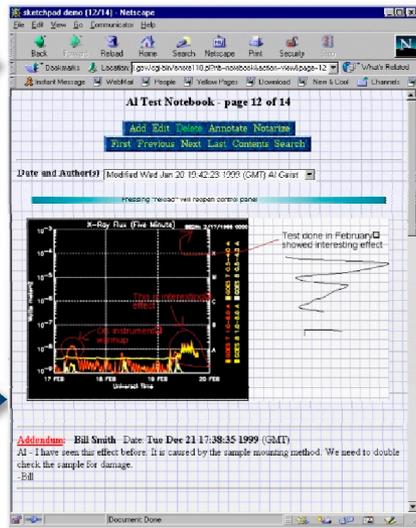
Accessible with password through secure web site



Reading entries

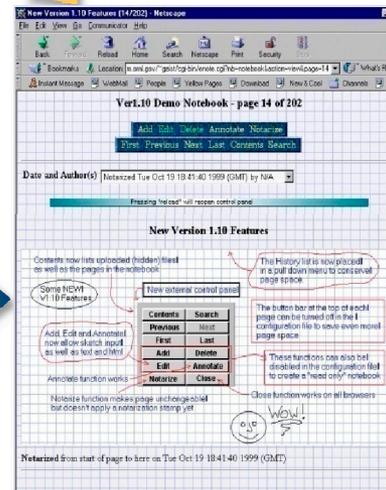


Annotation by remote colleagues



Drag and drop notes from private to shared notebooks

Personal (stand alone) notebook



Advantages and Features

- Ease of use, intuitive
- Look and feel of paper notebook
- Access from any web browser
- No software to install
- Can be shared across group
- Or set up as personal notebook
- Can run stand-alone on laptop

Input from

- Keyboard
- Files
- Images
- Voice
- Instruments
- Sketch pad

www.csm.ornl.gov/~geist/

ORNL notebooks used in production

- The ORNL electronic notebook software is freely available to
 - General research community
 - Academia
 - Industry
- Thousands of users worldwide
- Hundreds of electronic notebooks have been set up across the DOE labs in
 - Collaborative projects
 - Beamline and instrument logs
 - Research groups



Latest installation is at the Spallation Neutron Source

ORNL basic notebook functionality

The screenshot shows a notebook page titled "Spallation Notebook - page 4 of 4". The interface includes a menu bar with "Add", "Edit", "Delete", "Annotate", and "Notarize" options. Below the menu bar are navigation buttons: "First", "Previous", "Next", "Last", "Contents", and "Search". A "Date and Author(s)" field displays "Added Wed Jan 21 19:10:06 1998 (GMT) Al Gore" with a pull-down arrow. A status bar at the bottom indicates "Pressing 'reload' will reopen control panel".

Annotations with arrows point to the following features:

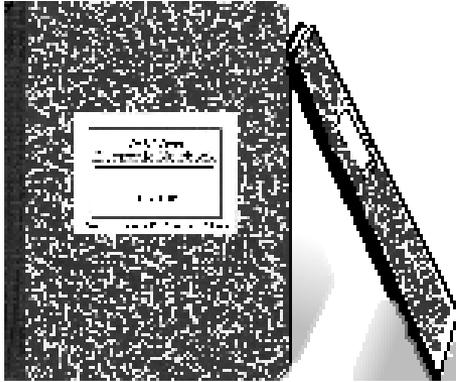
- Modification buttons**: Points to the "Add Edit Delete Annotate Notarize" menu.
- Notebook title**: Points to "Spallation Notebook - page 4 of 4".
- Page location**: Points to "page 4 of 4".
- Navigation buttons**: Points to the "First Previous Next Last Contents Search" row.
- Change history (pull down list)**: Points to the "Date and Author(s)" field.
- Searching**: Points to the "Search" button.

Noncompliance features requested by users

- Editing existing pages (*until notarized*)
- Deleting pages (*but not actually removed*)

Can be disabled at setup

Many uses besides compliant notebooks



- The technology lends itself to a broad set of uses, many of which don't require any special compliance
 - Has been useful for acceptance, familiarity, and buy-in

Existing uses

- Shared project notes
- Proposal development
- Meeting notes
- Instrument logs
- Centrally updated manuals
- (Chemical) inventory
- Distance learning
- Teaching tool
- Patient medical records
- Medical research logs
- Project tracking
- Private notebooks

ORNL electronic notebook users

Popular across a broad range of users

Government

- All DOE Labs
- NASA
- EPA
- USDA
- DOD

Industry

- DuPont
- Eli Lilly
- Merck
- 3M
- DynaCorp
- Kellogg
- EMS
- Scripps Howard
- Hydro-Quebec Power
- BP Chemicals
- Hoffmann La Roche
- Many more

Medicine

- Mass. General Hospital
- St. Jude Children's Hospital
- Chicago Medical Center
- Sloan-Kettering Cancer Center
- Walter Reed Army Hospital
- Etc.

Education

- Krell Institute
- Ohio State
- U. Delaware
- SUNY
- RPI
- U. Mass.
- NCSU
- Penn. State
- Portland State U.
- Shodor Education Foundation
- Many more



www.csm.ornl.gov/~geist/java/applets/enote/users.html

Spallation Neutron Source (SNS) notebooks

- The electronic notebook software for the SNS is being developed based on the research done in this project
- Support for different types of notebooks
 - Instrument notebooks
 - Record events and annotations regarding an instrument
 - Structure fixed; entries can't be edited but can be annotated
 - Proposal notebooks
 - Contain research annotations for a proposal and its experiments
 - Structure and editing policies under control of proposal PI
- Layered access control for SNS users and groups
 - Personal notebooks
 - Shared proposal and instrument notebooks
- Web-based user interfaces using AJAX
- Support for Wiki-formatting to support easy input of structured text
- JCR-based storage system

Contact

AI Geist

Computer Science Research Group
Computer Science and Mathematics Division
(865) 574-3153
gst@ornl.gov