

**PARTICIPANTS**

(loosely grouped by expertise; several individuals deserve multiple listings)

NATIONAL SCIENCE FOUNDATION

Rich Lane  
Walt Snyder

CHRONOS STEERING COMMITTEE

Cinzia Cervato, Iowa State  
Bruce Wardlaw, USGS

INFORMATION TECHNOLOGY

Chaitan Baru, UC San Diego Supercomputer Center, GEON  
Geoff Bohling, Kansas Geological Survey, Statistics and GIS  
Doug Greer, UC San Diego Supercomputer Center  
Dogan Seber, UC San Diego Supercomputer Center  
*Others*, UC San Diego Supercomputer Center

GEOCHRONOMETRIC/PALEOMAGNETIC DATA/TOOLS

Anthony Koppers, UC San Diego IGPP

PALEOGEOGRAPHIC TOOLS:

Allister Rees, Arizona, Paleogeographic Atlas Project, GEON  
Chris Scotese, Texas Arlington  
Alan Smith, Cambridge

PALEOBIOLOGICAL TOOLS

John Alroy, NCEAS Santa Barbara Paleobiology Database

CORRELATION/SEQUENCING TOOLS

Fritz Agterberg, Geological Survey of Canada (RASC)  
Vladimir Davydov, Boise State (Graphic Correlation)  
Lucy Edwards, USGS (Graphic Correlation, No-space Graphs)  
Pete Sadler, UC Riverside (CONOP)

TIME-SERIES TOOLS

(Linda Hinnov Johns Hopkins)

GENERAL STRATIGRAPHIC TOOLKITS

Oyvind Hammer Oslo (PAST)  
Roy Plotnick Illinois Chicago (STATISTICS)

## AGENDA (questions in the boxed paragraphs attempt to proceed from what to how to when.)

### MONDAY MORNING SDSC Rm 462 - (CONTINENTAL BREAKFAST SERVED AT 8:00)

#### “8:30” – 10:00 (WHO’S WHO)

- UC San Diego - Welcome and housekeeping details Chaitan Baru
- CHRONOS - Welcome and Workshop goals Cinzia Cervato

*A core of the CHRONOS initiative has been funded for an initial 2-year phase. CHRONOS should have tools for three general purposes – data retrieval, data visualization (especially paleogeographic and columnar formats), and data analysis (especially sequencing, correlation, and time series analysis). Data retrieval tools are integral to the database management. With this workshop, CHRONOS is seeking advice from the community concerning the desirable features of the visualization and analysis tools. CHRONOS is seeking a vision for the future, but also encourages this workshop to explore practical matters of implementation including software ownership, programming languages and hardware compatibility.*

- NSF - Balance between infrastructure and domain science Rich Lane Walt Snyder

*CHRONOS is a “cyber-infrastructure” initiative. Is the development of analytical tools likely to be considered to have crossed the line into domain science? What is the recommended way to pursue funds to develop tools? Is the upgrading and maintenance of software tools a legitimate infrastructure activity? Is there an advisable balance to be maintained between data compilation and tool development?*

- **Brief Self Introductions** **All Participants**

**As examples of potential users/contributors/developers/managers in the CHRONOS community, what background and expertise do you bring? For what kinds of questions would you (your colleagues and students) expect to retrieve data through CHRONOS? What languages and hardware would you be using? What kinds of technical assistance from CHRONOS or GEON would be critical – GIS enablement, parallelization of codes, web services for existing tools? What are your main hopes and fears for the CHRONOS toolbox?**

#### coffee break 10:00 – 10:20

#### 10:20 – 12:30 (FORM AND CONTENT OF THE TOOLBOX)

- IT presentation about possible structures and problems Chaitan Baru

*Should we anticipate that tools will need to be re-written to the uniform language and hardware specifications of some central CHRONOS server, or will the central node be able to manage the exchange of data with peripheral nodes at which the hardware and compilers are tailored to tools as developed? Will the tools run on CHRONOS machines and provide output for the user, or will the user be able to download tools and data? Which popular languages, compilers, and hardware will be easy to accommodate? Which will be difficult? would any be impossible?*

- Breakouts (2 groups: one with visualization focus; one with analytical focus; IT experts in both)

*Ideally, what visualization and analytical tools should the CHRONOS toolbox provide? Can these be prioritized in terms of need? Are some tools necessary for the operation of others? Can they be ranked in terms of technical difficulty to prepare and support? Should there be two toolboxes, one for expert research, another for lay people and teaching purposes? Which tools would be in which box?*

### MONDAY WORKING LUNCH 12:30 – 1:30 (TIME FOR DEMONSTRATION OF SOME TOOLS)

### MONDAY AFTERNOON (HOW TO ACCOMMODATE/ENCOURAGE CONTRIBUTIONS)

#### “1:30” – 3:30

- Plenary session: summaries of morning breakouts ()
- Breakouts (2 groups: IT experts in both)

*From the contributor’s side: What are the hindrances to contributing existing software or developing new software for CHRONOS? What are the technical difficulties? What are the intellectual property considerations? What are the commercial/financial considerations?  
From the CHRONOS side, what are the hindrances to accepting contributed programs or soliciting new ones? How do we mitigate the hindrances? What quality control and testing should be applied? How should upgrades be handled?*

**coffee break 3:30 – 3:50**

**3:50 – 5:30**

- Plenary session: - summaries of breakout discussions concerning contributors
- Tools for Time Series Analysis/Visualization Linda Hinnov (remote presentation)
- Plenary Discussion – Questions of scaling up to a very large database with multiple users.

*Will the toolbox encounter special problems because of the large size of the data sets that might be retrieved? Would a large and varied user base present special problems? Should CHRONOS develop improved and enhanced tools to handle the additional opportunities offered by a new stratigraphic database of unprecedented size and scope? Should CHRONOS hardware be dedicated to solving some of the time-intensive problems? Are there predictable analytical tasks that warrant continual background processing? Should CHRONOS retain the “answers” to some questions after the tools have been used to analyze them (e.g. ages of boundaries; sequences of events)?*

**WORKSHOP DINNER AT RESTAURANT PIATTI (WALKING DISTANCE FROM HOTEL) 7:00 - ?**

**TUESDAY MORNING CONFERENCE ROOM IN THE "INSTITUTE OF THE AMERICA'S", ADJACENT TO SDSC MAIN BUILDING (CONTINENTAL BREAKFAST SERVED AT 7:30)  
(HOW TO EDUCATE USERS)**

**“8:00” – 10:00**

- Calibration techniques for the 2004 Geologic Time Scale Fritz Agterberg

*What kinds of challenges arose in the most recent attempt to calibrate a global geologic time scale? What numerical methods were developed for the task?*

- breakouts (The user interface)

*From the user’s perspective, especially the least mathematically sophisticated, what are the hindrances to opening the toolbox? How should CHRONOS encourage use of the toolbox? Is there a limit to the sophistication of tools that should be offered? How can CHRONOS train the users of the toolbox to select the appropriate tools and use them correctly? What level of technical support is feasible? Should CHRONOS treat the researchers and laypersons differently?*

**coffee break – 10 - 10:20**

**10:20 – 12:00**

- Plenary session: summaries of morning breakouts ( )
- Plenary Discussion (Enlarging the community of developers)

*Can CHRONOS encourage users to imagine new tool possibilities? How might CHRONOS foster new collaborations between geologists, programmers, statisticians, operations researchers, and educators? What are the options for sharing the task of tool development with other databases and infrastructure initiatives? Is the current mix of IT and geologic expertise sufficient for optimal tool development?*

**Tuesday Lunch 12:00 - 1:00**

**TUESDAY AFTERNOON (RECOMMENDING A TIMELINE FOR CHRONOS)**

**“1:00” – 5:00**

Plenary Discussion A manageable time line All Participants

*What can the CHRONOS toolbox realistically deliver in its first phase (next 18 months)? How should CHRONOS prepare the community of tool developers and users for the next phase (5 more years)?*