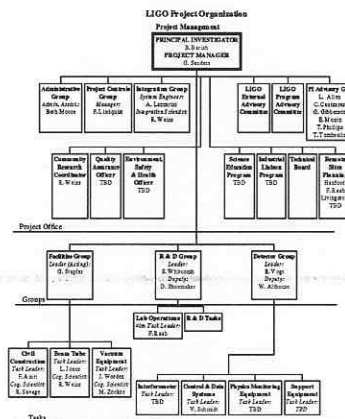

LIGO Research Community

Gary Sanders
NSF Review
May 22, 1995

LIGO Organization



External Users and Advisors

- LIGO involvement with the scientific community
 - » All who are interested in exploiting the scientific opportunities offered by LIGO
 - » Nominating Committee
 - » Executive Committee
- Pre Program Advisory Committee
- Program Advisory Committee
- External Advisory Committee

LIGO Users Community

Gary H. Sanders
California Institute of Technology
Aspen Winter Conference on
Gravitational Waves and Their
Detection
January 24, 1995

Traditional “Users” Models

- High Energy and Nuclear Physics
 - » Accelerators
 - CERN, FNAL, TRIUMF, SIN, Frascati, Saclay
 - » Reactors
 - Grenoble
- Astronomy
 - » Telescopes
 - Palomar, Arecibo, Submillimeter, Owens Valley, Hubble
 - » Magnetic Fusion Machines
 - TFTR, MFTF, ITER
- Materials Science
 - » Light Sources
 - » Spallation Sources

“User” Models (recited by a high energy physicist)

- Facility capabilities supported by in-house team
- Access to facility generally open to international community
- Research can be collaboration between in-house and community scientists
- Research proposals are collaborative and submitted to peer review
- Review includes scientific/technical review and agency funding review
 - » Scientific review generally held by facility Director/Principal Investigator
 - » Agency holds funding review
- Facility creates a Program Advisory Committee
- Users organize a Users Group with elected leadership and charter
 - » Users Group becomes the “customers” voice

Immediate User Issues

- User requirements for facilities
 - » Visitor accommodations - offices, labs, food, sleeping quarters
 - » Clean room storage and work areas for test and assembly - "staging" areas and labs
 - » Computing
 - » Intellectual climate
- Computing infrastructure
 - » hardware environment
 - » software tools
 - AVS vs. Khoros
- Review of proposals
 - » Early LIGO program
 - » Advanced detectors

National/International

- US groups
 - » NSF funding proposals
 - » LIGO project deliverables funded by LIGO
- International Gravity Wave Network
 - » Interlaboratory agreements to share data for combined results
 - » Share in technology development
- International joint projects
 - » Government to government

AVS 5 vs. Khoros 2

- Price
 - » AVS is \$7K - \$25K/user
 - » Khoros is "free"
- Support
 - » AVS offers commercial type support
 - » Khoros is informal and unpredictable
 - LIGO may have to hire support staff
- Distribution licenses
 - » AVS run-time modules cost \$
 - » Khoros executable modules free

LIGO considering selection within 1995

(LIGO has negotiated "community" price 40% lower)

Tribe - "Sleeper"

tribe@world.std.com

SUPERCOLLIDER

Got the call just yesterday
And now it seems as if
It's always been this way
Hasn't told his wife
Hasn't told his kids
If there was anything left
He's forgotten it

He's gone to Texas
To watch the holy fire burn
He's gone to build
He's gone to build the supercollider

Late at night
With no one else around
He sits there staring at
The atoms bouncing 'round
Live your life
Another time
Let's go to Texas
And watch the holy light shine
Let's go to see
Let's go to see the supercollider

Aspen Discussions

- “Users Group Charter” strawman (Berley/BNL model) discussed
 - » “Users” changed to “Research Community”
 - » Changes made to Executive Committee and nominating process
 - » Revised draft charter agreed to at end of day
- Communique sent internationally by Syd Meshkov
 - » Conference proceedings and communique (L950365) available
 - » comments on role of LIGO Research Community
 - » comments on nominating process
 - » comments on composition, membership, and organization
 - » names submitted for Nominating Committee and LIGO Pre Program Advisory Committee
- Response was very supportive and constructive

Discussions with VIRGO

- Barish/Sanders meeting with Giazotto/Brillet in March
- Broad agreement on need for intimate collaboration to optimize physics output of LIGO/VIRGO
- Draft of Memorandum of Understanding underway
- Agreement to exchange personnel, information, technical advice, technology
- Plan to form working groups on data collection, data analysis protocols, observing/maintenance cycles
- Possibility to jointly form LIGO/VIRGO Research Community with rotating meetings

Next Steps

- **New communique to community will**
 - » Announce formation of LIGO Pre Program Advisory Committee to:
 - Advise on formation and process of LIGO Program Advisory Committee
 - Serve as interim External Advisory Committee on technical issues
 - Advise on formation of visitor's program
 - Serve as Nominating Committee in formation of LIGO Research Community
- **Membership**
 - » P. Saulson(Syracuse) - Chair, S. Finn(Northwestern), A. Giazotto(Pisa/VIRGO), J. Hall(JILA), W. Hamilton(LSU), C. Prescott(SLAC), A. Ruediger(MPI-Garching/GEO)

Memoranda of Understanding

- **Standardized format**
 - » MOU - broad areas of agreement, legal principles, description of general programs, no fixed term
 - » Attachments - written as needed with fixed terms and describing specific tasks, deliverables, dates and payments, if relevant. These may be rewritten and replaced without modifying the MOU
- **NSF visibility/concurrence**
 - » domestic, <\$100K - NSF provided copies
 - » domestic, >\$100K - NSF concurrence
 - » international, NSF concurrence
- **Thorne(Caltech), Australia, Bender (JILA), VIRGO... in the works**

Plans

- LIGO Research Community
- MOU's
- LIGO/VIRGO working groups
- LIGO Visitor's Program
- Program Advisory Committee
- External Advisory Committee

LIGO - L950365-00-M

From syd@ligo.caltech.edu Fri Feb 10 12:19:06 1995
To: community@ligo.caltech.edu
Subject: Aspen meeting communique
Cc: syd@ligo.caltech.edu
Content-Length: 24372
X-Lines: 536
Status: RO

Aspen meeting communique

Dear colleague:

During the recent 1995 Winter Conference on Gravitational Waves at the Aspen Center for Physics, a nearly day long set of open meetings discussed organizational structures and modes of communication for the gravitational wave research community in the era of LIGO, VIRGO and the other planned interferometric detectors, as well as the new generation of resonant mass detectors. Mindful of the fact that any single meeting could not include all interested researchers, this message is being sent to attendees of that meeting, as well as others listed in several other relevant distribution lists. Our intent is to inform a broad audience in summary fashion of the discussion that occurred at the Aspen Center and to ask for your input in several actions that are contemplated for the near future. **REQUESTS FOR INPUT ARE LISTED BELOW UNDER THE HEADING "REQUESTS TO RECIPIENTS OF THIS MESSAGE."**

The overarching goal that emerged during the discussion was the need to define:

1. the means by which the gravitational wave research community might communicate data between detectors for coordinated analysis
2. the modes of collaboration in new research proposals for LIGO and other detectors
3. and the ways in which the scientific opportunities offered by the new detectors might be maximized.

A narrower goal was the definition of ways in which the research community might provide advice to the LIGO management on future review and accommodation of LIGO- related research proposals. Finally, the establishment of a formal mechanism of bi-directional communication between LIGO management and the interested research community was discussed. The latter topic included discussion of a charter for this mechanism and the steps needed to "bootstrap" it into existence.

THE ASPEN DISCUSSIONS

The discussions reported in this message began with a 3 hour meeting of all attendees at the Aspen Center. This initial session opened with a presentation of the views from the LIGO Project in which the need for open communication with the research community was outlined.

Speaking for LIGO, Gary Sanders described the experience in other experimental fields in which a major research facility is accessed by an external research community. Sanders posed the question of how such models drawn from particle and nuclear physics and astronomy might be applied to LIGO as a new national and international scientific opportunity. He also described several decisions under consideration by LIGO that may affect future users of LIGO. This included the definition of the on-site facilities needed to assemble and install future LIGO detectors, and the adoption by LIGO of a modeling environment that may become a de facto standard for the LIGO research community. The latter decision may have some financial impacts on university groups as the candidate software tools vary in licensing cost and support infrastructure. It was stated that LIGO needs to establish an open mechanism for communication with potential LIGO researchers, a mechanism for review and support of research proposals to exploit the LIGO facility, and a means by which LIGO can integrate its planning with the global community of detectors.

Responding to these needs, he circulated a draft charter for a "LIGO Users Group" for discussion, and a draft document written by Rai Weiss which described a LIGO Collaborative Program. The Weiss document included a description of a LIGO Pre-Program Advisory Committee intended to form temporarily to advise LIGO management on how to call for and review research proposals to LIGO. This committee would go out of existence and be replaced by a LIGO Program Advisory Committee that would actually review proposals and advise LIGO management on what research should be included in the program. These documents were the subject of extensive discussion.

Sanders also asked for discussion of how the various gravity wave detectors and interested theoretical and computational physics groups might coordinate discussion of issues central to all such as data sharing protocols, operational periods of detectors, technology sharing, and coordinated international facility planning. This, too, generated considerable discussion.

David Berley presented the views of the US National Science Foundation. He stressed the NSF interest in using LIGO to foster investigator driven research, international collaboration, and the best possible science. He presented a potential NSF planning scenario for the gravity research program in the LIGO era and encouraged the best possible proposals.

The discussion continued with brief statements of interest or perspective by Blair, Braginsky, Drever, Faller, Finn, Flaminio, Eric Gustavson, Kawashima, Saulson, Schutz, Thorne, and Ward generally representing many of the detectors and theoretical and computational programs in the world.

An extensive discussion by all touched on many of the issues raised. Sanders recommended at the conclusion of this meeting that all

interested parties meet during the unscheduled afternoon period to continue the discussion and to report back to the evening meeting of all attendees.

The afternoon meeting was attended by approximately a 15 people and it lasted for 2 hours. The discussion was broken into three topics. These were formation of the LIGO Pre-Program Advisory Committee (LPPAC), organization of a LIGO Users Group, and establishment of an International Gravitational Network.

The role of the LPPAC as defined in the Rai Weiss draft (included below as Appendix A) was discussed. It was recommended that this description was a good basis for a written charge by LIGO management to the LPPAC except for a slight modification to the wording on the membership composition designed to strengthen representation by the existing gravity community. It was furthermore recommended that by wide circulation of this memorandum by email, the interested research community should be invited provide to LIGO management with nominations to this committee. That request is formalized below.

The Charter for a LIGO Users Group was reviewed (The version resulting from the Aspen meetings is included below as Appendix B). Many at the meeting objected to the implication of the phrase "users" though it was noted that this term was widely used in other fields of large science. The meeting recommended that the name "LIGO Users Group" be changed to "LIGO Research Community".

It was agreed that the model charter should be recommended as a sufficient basis for initiating the Research Community and that extensive research into charters of many existing user organizations was not worth the time delay and effort. It was felt that establishment of this communication channel was sufficiently urgent to warrant rapid progress with the proposed charter as amended in the way described below.

It was agreed that LIGO staff scientists should be regular members of the Research Community but that they might not be permitted to chair the organization. The LIGO Principal Investigator should be an ex-officio member of the Executive Committee without a vote, but that the Committee could meet in closed session without the LIGO Principal Investigator if it wished. One other member of LIGO and at least one member from the community outside the United States should always be on the Executive Committee. It was also agreed that the proposal that issues be resolved by a vote of the general membership be dropped in favor of deliberation by the membership followed by voting of the Executive Committee. The provision for election of the Chair and Executive Committee by vote of the general membership was discussed in light of a recommendation that votes be cast only by each member institution as a single vote. The draft Charter below does not reflect this change which is left for further consideration and comment.

It was recommended that the nomination of members of the Nominating Committee be solicited by email. The Nominating Committee is defined in the text of the draft Charter below. LIGO management should consider the nominations in appointing a Nominating Committee. The Nominating Committee will make further refinements to the Charter and will form a slate

for email ballot for the initial Chair and Executive Committee members. Future elections would be held as described in the Charter.

Finally, the meeting assumed that after the year 2000 several interferometric detectors around the world, and a possible new generation of resonant mass detectors, would be making observations. A broad community would be involved in modeling sources and developing analysis techniques. Given this, international discussion and communication of global issues would be needed. Definition of data protocols, coordination of detector observational periods, and joint technology sharing were among the issues discussed. It was acknowledged that these can be very difficult issues to resolve. It was noted that a GravNet is in existence for information sharing at this time, but that an enhanced method of coordination and mutual support was desirable. It was felt that the Aspen meeting could be of limited significance in furthering this development as it required discussion among the management of all of the large detectors and the Principal Investigators of the various resonant mass detectors. Not all were represented at the Aspen meeting. The group assembled decided to recommend that by this communication to all detector projects and to the theoretical and computational groups, the respective leaders be urged to assemble during 1995, perhaps at the GR14 meeting in Florence, to initiate formation of an International Gravitational Network.

All of these recommendations were brought back to the evening meeting and the afternoon discussions were summarized. An additional one hour long discussion ensued. With minor modifications the recommendations of the afternoon meeting were accepted by consensus and the LIGO Project Office was requested to distribute in an email mailing the requests listed below for response by the broadest possible group of interested researchers.

REQUESTS TO RECIPIENTS OF THIS MESSAGE:

1. Please respond by email to the address from which this message was sent (syd@ligo.caltech.edu) to all of the requests below by February 28.
2. Please read the Draft Charter for a LIGO Research Community below (Appendix B). Please respond by email to the following:
 - a. Indicate any comments that you wish to make related to the draft Charter.
 - b. Indicate whether you wish to become a member of the LIGO Research Community and participate in the email ballot to adopt the Charter and to elect the Chair and Executive Committee members.
 - c. If you wish, please suggest names to nominate for membership in the initial Nominating Committee. LIGO management will use the nominations in formation of the Nominating Committee for this initial "bootstrap" to create

the LIGO Research Community. The Charter will determine the future election process. The Nominating Committee will refine the Charter, and prepare a slate for the election of the Chair and the Executive Committee.

3. Please review Appendix A below and examine the description of the proposed LIGO Pre- Program Advisory Committee. Please respond by email to the following:

- a. Indicate any comments that you wish to make related to Appendix A.
- b. Please suggest nominations to be considered by LIGO management in forming the LIGO Pre-Program Advisory Committee.

4. Please consider the possible roles and functions of an International Gravitational Network. Provide your comments by email. For those recipients of this message working in gravitational wave research groups, consider the ways in which such a network would affect the research conducted by your group.

This message will be posted on the World Wide Web pages of LIGO. These can be accessed at <http://www.ligo.caltech.edu> under the subject of meetings meetings and conferences. Please feel free to distribute this message to any potentially interested parties.

APPENDIX A: INFORMAL DRAFT DOCUMENT ON THE LIGO COLLABORATIVE PROGRAM AS MODIFIED BY THE ASPEN MEETING DISCUSSION

ORGANIZATIONAL AND PROGRAMMATIC CONCEPTS USED IN THIS DOCUMENT

- LIGO Pre Program Advisory Committee (new and transient)
- LIGO Program Advisory Committee: (new)
- LIGO Research Community: Combined External/Internal group (new)
- LIGO community research coordinator: position in LIGO project (new)

AIMS OF THE PROGRAM

- 1) To enhance the probability of the successful detection of gravitational waves and to open the field of gravitational wave astrophysics.
- 2) To increase the active participation of scientists and engineers in the scientific and technical challenges of gravitational wave detection.
- 3) To develop a user community for the LIGO facilities.
- 4) To enhance the effectiveness of the scientific constituency for the field of gravitational wave astrophysics.

COMMUNICATION OF THE PROGRAM TO THE SCIENTIFIC COMMUNITY

NOTE: (date) occurred or planned

1) Organization of sessions or presentations on gravitational wave detection at meetings of scientific and technical societies, and at planning exercises; some currently scheduled examples include:

American Physical Society Spring meeting (4/94)
Snowmass APS Planning Meeting for Particle and Nuclear Astrophysics and Cosmology (7/94)
Marcel Grossman meeting (7/94)
Optical Society of America annual meeting (10/94)
International Meeting on General Relativity and Gravitation (7/95)

2) A several day workshop organized by the LIGO Project this calendar year, to provide information about all LIGO issues relevant for research by the external science and engineering community. This will be widely advertised as an opportunity for people who might want to work on LIGO-related research to get educated about LIGO physics. An attempt will be made to draw in people from all the relevant communities, e.g. quantum optics, classical optics, materials science, condensed matter, signal processing, astrophysics, and relativity.

3) Topical workshops organized by LIGO, VIRGO, EGO, AGO and LIGO affiliates, in areas of special interest to the field:

NOTE: Workshops to be organized by an international group that the LIGO community research coordinator will pull together at the start. Once a LIGO Research Community has been formed, these will be organized by the chair of that group. The workshops will take place at various locations not only Pasadena and Cambridge.

Thermal noise (1/94)
Coalescing-binary waveforms and data analysis (1/94)
Optics: modeling, fabrication and testing (95)
Interferometer configurations (95)
Data Analysis (95)
Seismic Isolation (95)
Laser sources (95)
Applications of squeezed light (96)

4) Publication of LIGO research results (continuing)

5) Online list of LIGO publications and selected internal LIGO documents (94)

6) Development of a LIGO facilities interface document (96)

ORGANIZATION

A. LIGO Pre Program Advisory Committee (LPPAC): A temporary committee formed by LIGO Management, with the concurrence of NSF, composed of people experienced in operating scientific user facilities and members of the gravitational wave research community. The function

of the committee is to advise LIGO Management on the composition, charter and role of the LIGO Program Advisory Committee (LPAC).

The LPPAC will consider the most effective composition of LPAC membership drawn from LIGO Management and external members.

The LPPAC will also consider the advisability of LPAC roles which could include:

- 1) To give LIGO Management advice on proposals by potential collaborators.
- 2) To advise LIGO Management on:
 - a) The schedule and phasing for the installation of detectors in LIGO, their observational programs and their enhancements, and for other facility uses by internal and external users.
 - b) The schedule and phasing for the enhancement of the LIGO facilities.
 - c) The LIGO data analysis program.
 - d) The program for coordinated observations with other gravitational wave and astronomical facilities.
 - e) International collaborations

B. The LIGO Research Community: The group of scientists and engineers with interest in the research to be carried out by LIGO. The group would include both people inside and outside the LIGO Project and would have an elected chair who thereby becomes a member of the LIGO Program Advisory Committee. The group would be composed primarily but not exclusively of scientists and engineers who take part in the collaborative programs described below or who are members of the LIGO team. The group will include subgroups that focus on specific issues; for example, a subgroup on "Sources, Waveforms, and Computational Algorithms," which was initiated at the coalescing binary workshop of 1/94.

C. LIGO community research coordinator: A point of contact for scientists and engineers who wish to carry out collaborative programs with the LIGO project. The function of the coordinator is to provide potential collaborators with initial advice and to guide them to knowledgeable and interested people within the project.

MODES AND STYLES OF COLLABORATION

The LIGO project encourages collaborations and envisages a range of styles dependent on the interests of the collaborator or collaborating group and the needs of the project.

Examples:

- a) Visitors: Scientists and engineers who would like to work with the LIGO project for a brief period at Caltech and/or MIT and then return to their home institutions. Conversely, LIGO team members who would like to work for brief periods with scientists and engineers in allied areas at their home institutions.
- b) Scientists and engineers interested in carrying out independent but LIGO relevant research programs at their home institutions.
- c) Scientists and engineers interested in developing hardware, models, and software deliverables on a project determined schedule.
- d) Scientific groups, possibly including LIGO team members, interested in developing new detector systems to be incorporated in the LIGO after initial operations.
- e) Data users: Individuals or groups that intend to analyze archived and validated gravitational wave data sets.
- f) Scientists interested in making astrophysical observations in coordination with LIGO.

The specific collaborative arrangements depend on the nature of the work proposed. Major proposals are expected to be reviewed by the LPAC as well as the funding agencies.

 APPENDIX B: DRAFT CHARTER FOR A "LIGO RESEARCH COMMUNITY"

CHARTER

LIGO RESEARCH COMMUNITY

The purpose of this Community is to provide an organized channel for the interchange of information between the LIGO management and those who utilize the scientific opportunities afforded by LIGO. Representing a wide spectrum of research workers, the group will, on the one hand, make known to the LIGO management the needs and desires of those actively engaged in research projects and, on the other, provide a means for LIGO to inform them with respect to current and future plans for LIGO. It is expected that, from a thorough discussion of current and future projects and capabilities, the LIGO management will be in a better position to evaluate the needs of the majority of its research community and that the community, being better informed, can more efficiently plan the utilization of LIGO facilities.

A. ORGANIZATION

1. Membership:

- a. Membership shall be open internationally to scientists and engineers who are interested in the detection of gravitational waves and

related fundamental science.

b. Scientists employed by LIGO are eligible for membership. However, they may not hold voting positions on the Executive Committee, nor be elected as Chair.

c. Consultants on special aspects of particular problems may be called to attend meetings at the discretion of the Chair.

2. Officers:

a. A Chair shall be elected by plurality vote of the membership every two years. At least two candidates for Chair shall be presented by a Nominating Committee and by nomination from the floor during a meeting.

b. A Secretary shall be appointed by the Chair to serve at his or her discretion.

3. Standing Committees:

a. The Executive Committee shall consist of the Chair and 7 members elected by written ballot for three-year terms. Members of the Committee shall rotate; two or three new members shall be elected each year. Nominations shall be made by the Nominating Committee and by nominations from the floor during a meeting. The Executive Committee shall function as the Agenda Committee and as an Advisory Committee to the Chair on matters relating to user affairs.

b. The Nominating Committee shall consist of four members appointed by the Executive Committee. The Nominating Committee is charged with preparing a slate of candidates for election of Chair and Executive Committee members. The slate should include at least two candidates for the office of Chair in years when a Chair is to be elected, and at least one more candidate than the number of Executive Committee members to be elected. The slate should reflect a balance of interests and research areas related to LIGO scientific opportunities such as quantum optics, materials science, numerical relativity, theoretical physics, resonant bar detectors, astrophysics, laser science, and computation. This list is meant to be illustrative and not exhaustive or restrictive and not as establishment of rigid quotas.

c. The Chair shall remain as a member of the Executive Committee for one year following the expiration of his/her tenure as Chair. In years when an ex-Chair is on the Committee, the total

Committee membership shall be increased by one.

d. The LIGO Principal Investigator shall be an additional Ex Officio member of the Nominating Committee and a non-voting member of the Executive Committee. The Executive Committee may, at its discretion, meet without the Principal Investigator present.

B. MEETINGS

1. Meetings shall be called at the discretion of the Chair except that a minimum of one meeting shall be held annually. The locations of the meetings shall be selected at the discretion of the Chair. Except in unusual circumstances, notice of the meetings shall be given at least one month in advance to all members.

2. An agenda for each meeting shall be provided by the Chair with the aid and advice of the Executive Committee. A short written summary of the items on the agenda shall be provided to the members at least one week in advance of the date of the meeting.

3. General meetings of the membership shall be held to inform the membership of LIGO plans and issues. The general meetings shall also be used for discussion of issues raised by the Research Community members. Decisions of the LIGO Research Community shall be made through a vote of the Executive Committee.

C. PROCEDURAL RULES

1. Minutes of the Executive Committee Meetings shall be recorded by the Secretary and shall include a brief resume of the results of the deliberations. After approval by the Chair, copies of the minutes shall be provided to all regular and Ex Officio members of the Research Community.

----- End Included Message -----