



NSF IUCRC

CENTER FOR GEOMECHANICS AND MITIGATION
OF GEOHAZARDS (GMG)

Center Bylaws

California Institute of Technology, Pasadena

Last Updated: May 06, 2023.

ARTICLE I - INTRODUCTION

1.1 The following Bylaws will be used to govern the Center of Geomechanics and Mitigation of Geohazards at the California Institute of Technology (CENTER), an NSF Industry/University Cooperative Research Center (I/UCRC).

1.2 The Bylaws can be amended at any time by an affirmative vote of two thirds of the members of the Industrial Advisory Board (IAB) and the affirmative vote of the California Institute of Technology.

1.3 Definitions

1.3.1 “Center of Geomechanics and Mitigation of Geohazards” is an NSF Industry/University Cooperative Research Center (I/UCRC)” consisting of a single university site at the California Institute of Technology.

1.3.2 “Member” means a company or other entity that has signed the CENTER Membership Agreement and paid one or more membership fees during the current Membership Year or has been admitted as an “In-Kind Member” pursuant to Article 3.4. For Members entitled to voting rights, each Member’s voting representative is automatically a member of the Industrial Advisory Board (IAB) during the term of the Member’s membership. The number of voting representatives per organization is capped at two.

1.3.3 “Membership Agreement” means the Industry/University Cooperative Center of Geomechanics and Mitigation of Geohazards Membership Agreement signed by a corresponding Member.

1.3.4 “Membership Year” means a twelve (12) month period beginning on September 1 and ending August 31.

1.3.5 Center Director means the faculty member responsible for all I/UCRC operations.

1.4 These Bylaws form part of the Membership Agreement with participating Members. In the case of any conflict between the Membership Agreement and these Bylaws, the members and the Center director will discuss the conflict and come to an agreement on how to revise the bylaws.

ARTICLE II - PURPOSE

2.1 The Center is designed to provide a forum for industry/university cooperative research.

2.2 *Vision Statement.* The vision is to be an internationally recognized leader in research that meets the needs of companies concerned with seismic hazards and the geomechanical effects of injection or extraction of fluids in the subsurface.

2.3 *Mission Statement.* The mission of the Center is to advance the understanding of geomaterials failure, in particular in the presence of fluids, for industry applications and geohazard mitigation by leveraging cutting-edge modeling, computing, experimental, geophysical and remote-sensing research.

2.4 *Research Focus.* The common research platform for GMG is the development of improved methods to assess the effects of fluids on deformation and failure of geomaterials, in particular.

- fracture geometry, transport properties, seismicity, and fluid flow induced by fluid injection in the subsurface and
- ground deformation, shaking, and potential damage to infrastructure due to induced and natural fault activity.

ARTICLE III - MEMBERSHIP

3.1 The CENTER membership contribution for “Full Members” is \$50,000 for research projects with 100% of the contribution directed toward research. Organizations with less than 500 employees can opt for an “Associate membership” status. The CENTER membership contribution for “Associate Members” is \$25,000 with 100% of the contribution directed toward research.

3.2 A Member may support the Center with one, two, or more membership contributions. However, the number of voting representatives per organization is capped at two.

3.3 All Members will sign the standard Membership Agreement.

3.4 An “In-Kind” membership is possible upon approval by the Center Director

with the consensus of the IAB. A member Organization that provides “In-Kind” membership contributions in lieu of cash payments will provide a listing of categorized items to be considered as its “In-Kind” support for approval.

3.5 An organization can observe an IAB meeting with approval of the IAB and with the understanding that the observing organization will need to sign a non-disclosure agreement.

3.6 A Company Member should have the intention of maintaining membership for at least three (3) years. Memberships are effective on the date of a signed membership agreement. Memberships are renewed annually and are not prorated. To renew membership, a Company Member shall pay the annual membership fee prior to the start of the Membership Year. In extenuating circumstances, this can be delayed until February 28 of the same calendar year with permission from the Center Director.

3.7 Removal. A Company or IAB may each at any time, by written notice to the other and to the Chairman, remove (with or without cause) any Board member who the removing Party had appointed. An IAB member may not be removed except at the written direction of the Party that appointed such IAB member; provided, however, the appointing Party shall be provided with notice by the Chairman of a Research Board member’s failure to satisfy the requirements for IAB member participation and attendance set forth in the Bylaws, as described in Section VII.

3.8 Resignation. A IAB member may resign at any time, by written notice to the Party that appointed him or her, and to the Chairman; provided, however, that the IAB may recommend that a member resign for member’s failure to satisfy the requirements for Board member participation and attendance set forth in the Bylaws, as described in Section VII.

3.9 Vacancies. If a vacancy occurs on the IAB for any reason, the vacancy shall be filled by appointment of a new IAB member by the Party entitled to appoint the IAB member creating the vacancy.

ARTICLE IV- MODALITIES

4.1 *Research Project.* Precompetitive research projects proposed by faculty researchers in response to industry identified needs. They are supported by

CENTER membership contributions as recommended by the IAB vote.

4.2 Enhancement Project. Additional funds provided by an interested company or companies (beyond membership contributions) can be used as supplemental funding for research projects with the clear understanding that knowledge and information generated will be equally shared among all IAB members.

4.3 The research projects will be executed by students, researchers, and faculty with eventual participation of personnel from company Members.

ARTICLE V- ORGANIZATION

5.1 The IAB comprises one representative of each member company. A member company can send as many delegates to the IAB meetings as it considers appropriate, but only one of them can be a voting IAB member.

5.2 The IAB will select a Chair and a Vice Chair for a two-year term after approval of the Bylaws and no less than every two years thereafter. Generally, the Vice Chair will become the IAB Chair when a new Vice Chair is elected by the IAB members. If the Chair withdraws from the Center during the two-year term the Vice-Chair assumes the Chair position and the IAB will elect an interim Vice-Chair.

5.3 The IAB Chair and Vice Chair will form an Executive Committee (EC).

5.4 Members paying cash membership contributions will have one representative at the IAB. An organization providing additional memberships will be entitled to have one voting representative on the IAB for every membership paid in full. The number of voting representatives per organization is capped at two. The voting procedure is detailed in Article XIV.

5.5 All IAB members will participate in the strategic planning of the CENTER and will assist the participating faculty in identifying pre-competitive, generic, industry-related, research problems. Furthermore, IAB members will assist in identifying appropriate industrial internship opportunities for students; help the CENTER Director and co-Directors in recruiting new members; review the research and educational programs and accomplishments of the CENTER; and recommend mid-course changes to meet IAB needs and concerns.

5.6 The CENTER Director will be responsible for all CENTER activities. The CENTER Director will be the Principal Investigator of the IUCRC grant.

5.7 The CENTER co-Directors will assist the CENTER Director. The CENTER co-Directors will be the co-Principal Investigator of the IUCRC grant. In the event Principal Investigator is unable to serve as the Director, one of the co-Directors will assume the Director role, subject to approval by the NSF.

5.8 Project Principal Investigators will manage specific research projects funded by the Center and will report directly to the CENTER Director. Project Principal Investigators will be identified in specific project proposals.

5.9 A Center Evaluator, appointed by the National Science Foundation (NSF), will work closely with the Center and the IAB to share IUCRC practices and objectively assess and report on Center activities and progress. The Evaluator will attend Center's IAB meetings on behalf of NSF and prepare an NSF report that will be shared with the cognizant NSF Program Director within a week after each meeting, administer NSF Surveys, prepare the Annual Center Assessment Report, and interview Center's inactive members.

5.10 The University Policy Committee will be comprised from the Caltech Administration and will facilitate the operation of the Center while ensuring compliance with the policies of Caltech. This committee will include the chairs of the GPS and EAS Divisions and a representative from the Industry Relation Office.

5.11 The CENTER Managing Director will conduct the day-to-day routine management and coordination of the Center activities.

ARTICLE VI- ADMINISTRATION

6.1 The Center Director and two co-Directors will work with the Industrial Advisory Board on strategic plans for the Center and on recruiting new Members.

6.2 The CENTER Director and co-Directors will constitute the Faculty Steering Committee which will review CENTER operational procedures and policy matters. The Steering Committee will meet at least once every other month.

6.3 The Center Director will submit an annual operating and research budget to the

IAB for review and recommendations. This will be available for review prior to the Spring IAB Meeting each year.

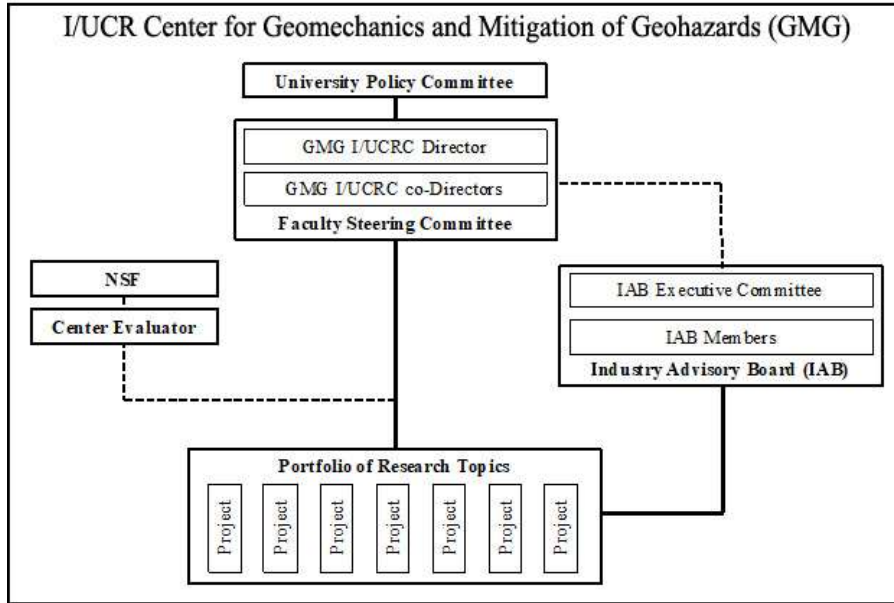


Figure 1. CENTER Organizational structure.

6.4 The Center Director, upon recommendation of the Industrial Advisory Board and the Faculty Steering Committee, will authorize the use of membership contributions by the Project Principal Investigators in support of Center research.

6.5 The Director and co-Directors will work with the appropriate departments on recruiting graduate students for the Center and will set standards for student participation; monitor student progress towards a degree; set goals for recruiting students (especially minority and women); promote multidisciplinary nature of the research program; and help students to organize industrial internships.

6.6 Each CENTER graduate student or postdoctoral research associate will have a Center faculty mentor and, if available, at least one Center industrial advisor. The faculty mentor is responsible for advising the student or postdoctoral research associate on university, departmental, and Center policies.

ARTICLE VII – INDUSTRY ADVISORY BOARD RESPONSIBILITIES

7.1 Two IAB meetings will be held during the year (spring and fall).

7.2 Company Members are expected to: (i) attend both semi-annual IAB meetings, in person (barring circumstances out of their control). Video- or tele-conference participation during project selection procedures is discouraged; (ii) participate in the process of reviewing and selecting research to be funded; and (iii) vote on issues before IAB. A Company Member who fails to attend, participate or vote shall be deemed to have no objections to decisions made at such meetings, no objections to selections resulting from such reviews, and no objections to the outcome of such voting, respectively.

ARTICLE VIII- REPORTING

8.1 The Center Director shall provide an annual report to the Members and to the National Science Foundation.

8.2 The Project Principal Investigators shall provide interim reports to the Center Director and to the Members as necessary at the completion of major research tasks. These interim reports will be distributed via the Center web site and email notification to all members once posted.

8.3 Project Closure: Each Project Principal Investigator shall provide a final project close-out report upon closure of the respective research projects. These reports will be distributed via the secure portion of the Center web site with email notification as required.

8.3.1 A final close-out report will be submitted to the Center Director and posted on the Center website withing thirty (30) days of a project's end date. The project's end date is typically the end of the GMG fiscal year, or another date as agreed to by the IAB and documented in the project's Executive Summary.

8.3.2 Each Industry Member will have forty-five (45) days after receipt of the final report to declare in writing to the Center Director any intention to pursue direct sponsored research on that project, outside of the I/UCRC.

8.4 All administrative issues, concerns, or conflicts regarding the activities of research and reporting are the responsibilities of the Center Director.

ARTICLE IX- MEETINGS

9.1 The Center Director, co-Directors and the IAB Chair will establish the schedule of activities and meetings for the Center as well as the agenda for the semiannual research review meetings.

9.2 The academic and IAB members for the CENTER will meet twice a year (spring and fall) with the date determined at the previous IAB meeting. CENTER IAB members are welcome to host/sponsor a Center meeting with the consensus of the IAB.

9.3 The IAB will meet twice a year to review research results, select projects, review budgets, and discuss the strategic plans for the Center. The IAB review meetings will coincide with the semiannual CENTER meetings. A Member may send more than one representative to the IAB meetings but may only have one voting representative per paid membership with the number of voting representatives per organization capped at two.

9.4 The University Policy Committee will meet as necessary to discuss and resolve the Center program and management issues.

9.5 Center meetings are closed to the public, because of proprietary Center information that will be discussed. Attendance is limited to faculty, staff, and students affiliated or potentially affiliated with the Center; representatives of Center Members; and the Center Evaluator and other NSF personnel.

ARTICLE X- RESEARCH PROJECT SELECTION PROCEDURE

10.1 All Center Members (Members) paying membership contributions in cash may participate in the selection and evaluation of research projects. Individual organizations may acquire multiple Center memberships, and therefore will have a corresponding number of voting representatives on the IAB. The number of voting representatives per organization is capped at two.

10.2 A portfolio of research topics relevant to the Members will be compiled annually based on the interests of the Members. These research topics will be posted on the Center web site (restricted) and will form the basis for cooperative discussions among the faculty and the industrial members.

10.3 The CENTER faculty will develop a set of project proposals consistent with the goals of their group, the interest of the Members, and the mission of the Center. The proposals will be posted on the Center web site prior to the IAB meeting.

10.4 At the semiannual research review meetings, faculty/student teams will discuss their proposals with IAB members and adjust the scope if appropriate.

10.5 The IAB will vote on the proposed projects as described in Article XIV, thereby indicating their interest in the projects, and providing a funding recommendation to the Center Executive Committee (composed of the Chair and Vice Chair of IAB) and Faculty Steering Committee (composed of Center Director and co-Directors).

10.6 The funding decisions are then finalized jointly by the Executive and Faculty Steering Committees.

10.7 Each project will be funded for one year at a time and can be renewed multiple times in equal competition with any newly proposed projects.

ARTICLE XI- PUBLICITY

11.1 A Member shall not use the name of the California Institute of Technology in any publicity, advertising, or news release without the prior written approval of an authorized representative of the Institute. Likewise, the California Institute of Technology may not use the name of a member in any publicity without the prior written approval of the Member. Press releases will be coordinated between the Center Director and participating university press office. Notwithstanding the foregoing, the parties may satisfy any reporting requirements of their respective organizations.

11.2 Subject to the recommendations of the IAB, the Center Director shall post the descriptions of all CENTER research projects on the Center web site. The descriptions shall not contain confidential or proprietary information and may be published freely.

11.3 The name of the Member may be identified on the Center web site or by NSF as a participant.

ARTICLE XII- PUBLICATIONS

12.1 Researchers engaged in CENTER research may disclose the methods and results of their research after a review by the Members for proprietary materials as outlined below.

12.2 At any time, the Director may submit an intent to publish Center information presented in summaries, semiannual reports, annual reports, or final reports; or arising out of or resulting from research projects; in the form of abstracts, presentations, or manuscripts. To inform members of the intent to release information, the Site Director shall submit a "Review of Information for Release" form containing the information to be published in the form in which publication will be sought to the Members. The Review form will be sent by email to the primary contact for each Member and posted to the Center website. It shall be incumbent upon the Site Director to obtain documented evidence that the primary contact for each member company has received the proposed release for review and comment by the Member. The information in the proposed release may be published in a substantial form (as submitted with the release form) if within fifteen (15) days after sending the Release form, and no Member has identified in writing if the publication contains patentable subject matter that requires protection and/or the publication contains Member's confidential information. In such cases, publication will be delayed up to sixty (60) days to allow for patent applications to be filed or confidential information to be removed. It is understood that in no case can this provision for delay of publication cause an unreasonable delay in the normal academic progress of a graduate student at participating University with respect to preparation and submission of a graduate thesis or dissertation.

12.3 CENTER and Member (s) may provide each other with certain information that is confidential or proprietary in nature (Confidential Information) if necessary to the performance of the research efforts. CENTER or Member (s) may refuse to receive such Confidential Information. Should a party choose to receive Confidential Information, then the receiving party shall receive and hold it in confidence and agrees to use its reasonable efforts to prevent disclosure to third parties. Any information considered by disclosing party to be confidential will be

clearly marked by disclosing party in writing, as “Confidential.” Orally disclosed Confidential Information shall be reduced to writing by the disclosing party within thirty (30) days of disclosure. The receiving party may not further disclose Confidential Information for a period of three (3) years from the date of disclosure, without permission from the disclosing party, except as necessary for the performance of the Center research.

Confidential Information shall exclude information which:

(a) is now public knowledge or subsequently becomes such through no breach of the Membership Agreement or Bylaws;

(b) is rightfully in the receiving party’s possession prior to the disclosing party’s disclosure as shown by written records;

(c) is disclosed to the receiving party by an independent third party who, to the best of the receiving party’s knowledge, is not under an obligation of confidentiality for such information to the disclosing party;

(d) is required to be disclosed by law or by judicial or governmental requirement; or

(e) is independently developed by or for the receiving party without benefit of Confidential Information received from the disclosing party as shown by written records.

ARTICLE XIII- BENEFITS

To the extent consistent with California Institute of Technology policies and practices Members will have the following:

13.1 All Full Members will have non-exclusive rights to the entire CENTER research portfolio under the conditions outlined in the Membership Agreement.

13.2 All Members will have an opportunity to directly contribute to CENTER research and education programs by participating to the research or serving as industrial mentors and/or thesis committee members as appropriate and consistent with the policies and procedures of participating Universities.

13.3 All Members will have an opportunity to propose case study problems, specific research problems, and focus areas for research.

13.4 All Members will have an opportunity to host postdoctoral research associates, graduate, and undergraduate students as industrial interns.

13.5 Technology transfer between the faculty/student research teams and Members will be promoted by: pre-doctoral and post-doctoral industrial internships; the direct involvement of the industrial advisor on the research team; and web-based submission of reports.

13.6 Each Member that joins the Center as a Full Member or an Associate Member by paying a cash membership contribution will vote on the selection of research projects supported by membership contributions. They will also be eligible to vote on all other Center matters and participate in the evaluation and discussion of research projects. The voting procedure is outlined below.

ARTICLE XIV- VOTING PROCEDURE

14.1 Voting on CENTER project selection will be based on membership contributions (cash contributions only). A Member (collectively through one or both of its voting representatives) will get 1 ballot for every \$10K of annual membership contribution paid up to a total of 10 ballots, e.g., \$50K annual membership contribution is equivalent to 5 ballots that a Member's voting representative(s) can cast as it best fits its interests while \$25K annual membership contribution is equivalent to 2.5 ballots. Members' voting representative(s) have the option to cast all of their ballots for one project or distribute them over several projects. The voting procedure consists of successive rounds with each voting Member casting 1 ballot per voting representative of a Full Member and 0.5 ballot per voting representative of an Associate Member in each round. After 5 rounds, the projects with insufficient funding to be executed (with less than 50% of the request funding in total) are discarded and the voting representatives of Members who voted for these projects can redistribute their ballots in successive rounds, with each voting once at each round, until all ballots are cast.

14.2 Voting on any issues related to CENTER, other than project selection (e.g., policies and operations), will be based on one vote per voting representative. If a Member has been elected to support the Center with two or more membership contributions, the number of voting representatives will be capped at two.

14.3 Each Member that joins the Center on an approved “In-Kind” under Article 3.4 can participate in the evaluation and discussion of research projects, but shall not have voting rights.

ARTICLE XV- NEW INDUSTRIAL MEMBERS

15.1 New Companies, Corporations, or Organizations may request, or be requested, to join a university affiliated site of CENTER as a Member. These new Companies, Corporations, or Organizations may join CENTER upon signature of the existing consortium Membership Agreement, acceptance of the current Bylaws, and payment of the NON-PRORATED annual membership contributions. Application of these new membership contributions shall be made to existing research programs at the affiliated site unless a new “interim” research program is otherwise approved by the Center Director, co-Directors, and the Chairman of the IAB. Continued funding of the “interim” research program is subject to IAB approval at the next annual IAB meeting under the terms of these Bylaws.

15.2 In the event a prospective Company Member desires to attend an IAB meeting, the Center Director shall first obtain from the prospective Company Member a signed nondisclosure agreement with terms sufficient to protect GMG, University Member, and Company Member information disclosed at such meeting consistent with the provisions of these Bylaws.

ARTICLE XVI- BROADER IMPACTS

16.1 The Center Director and co-Directors will develop an Outreach and Broader Impacts Plan to ensure that CENTER maximizes its impact on academia, relevant industry, and society. In part, the models, methodologies, and tools developed with support from the Center will eventually become part of the public domain through research publications and presentations, benefitting a wide range of companies beyond Center membership, and society as a whole.

16.2 The Center Director and co-Directors will develop a plan for broadening participation of underrepresented groups in science and engineering by engaging them in Center projects.

ARTICLE XVII- CONFIDENTIALITY

17.1 Except as provided in this article and the Membership Agreement, all information provided to Company Members, including information contained in annual reports, project status updates, and interim reports, whether available via the CRIS web site or distributed to the Company Members via email or otherwise, are non-confidential and each Company Member is free to use and disclose any information contained in such report for any purpose, subject to valid patent rights and copyrights.

17.2 Technical information, including technical information contained in any reports, shall be subject to the pre-publication review provided for in the Membership Agreement. Should any Company Member request a delay in publication during such review or should any Member University request a delay to file for patent protection, the Company Members shall not disclose such technical information during such delay, which shall not exceed sixty (60) days from the date such technical information is received. Except for this obligation, each Company Member will be free to use and disclose any technical information it receives from CRIS for any purpose, subject to valid patent rights and copyrights and subject to Member University's reserved right to first publish results of research.

ARTICLE XVIII- DISPUTES

18.1 The Center Director and Member shall attempt to informally resolve any disputes. If either party determines that the dispute cannot be informally resolved, either party may submit to the other party in writing a description of the dispute and the desired outcome and within thirty days a senior authorized official for each entity shall review the issues and work to resolve the issues. If both entities cannot agree upon a resolution, the parties retain the right to bring a lawsuit or seek any other legal or equitable remedy. Pending the final resolution of any dispute the entities agree to diligently proceed with the performance of the research. This dispute process does not preclude any party from exercising its right to terminate their participation under the terms of the Agreement and Bylaws.