

Proposal Guidelines for  
**Keck Geology Consortium Research Experiences for Undergraduates**  
 2022-2023 Programs

The programs described below reflect the recent NSF award to fund the Keck Geology Consortium REU through 2026. While retaining much of the historical structure of Keck projects, there are important differences, so please read the guidelines carefully.

**I. Background**

The research programs proposed for the 2022-2026 funding cycle include 3-5 Gateway projects (annually) for rising sophomores, and 1-3 Advanced Research projects (annually) for rising seniors (Figure 1). Both programs include common components (research, analytical and professional development) that have differing goals and activities appropriate to the students in each program.

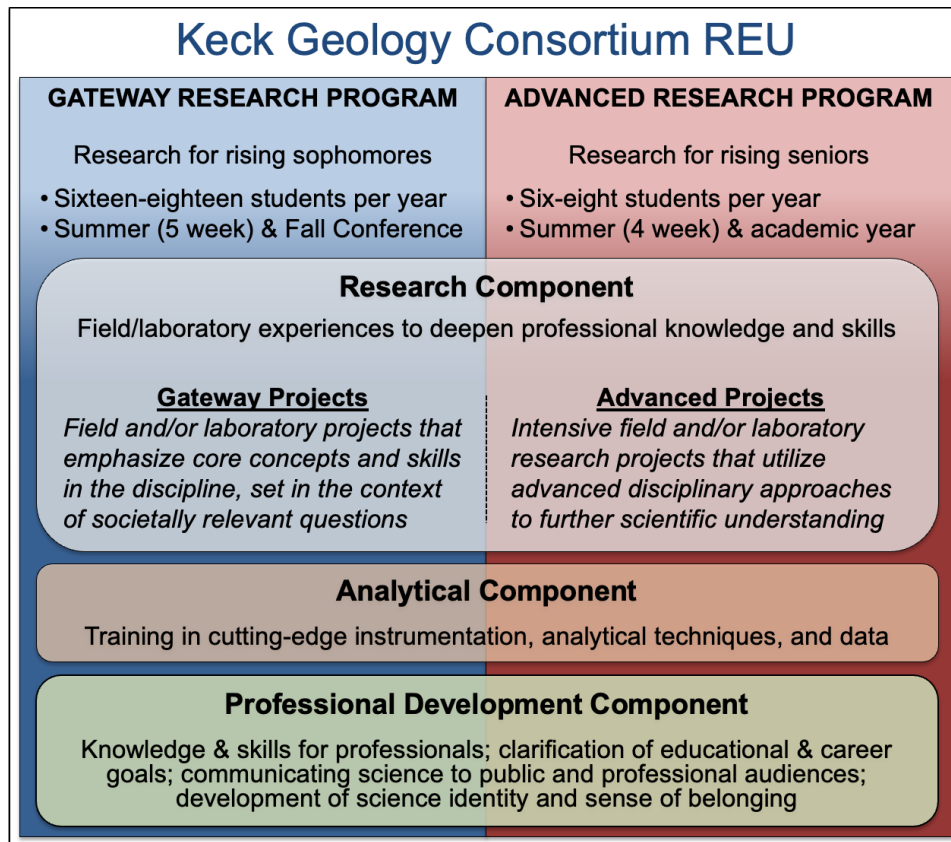


Figure 1. Diagram illustrating the goals and structure of the research, analytical, and professional development components in the Gateway and Advanced Research programs of the Keck Geology Consortium. See text for detailed explanation.

The **Gateway Program** for beginning students, with a goal of attracting students from underrepresented minority groups, focuses on exploration of the discipline and its intersections with socially relevant issues. Research projects in this program are designed to appeal to beginning students, especially those from diverse backgrounds, to introduce them to the breadth and excitement of the discipline through authentic research experiences, to deepen their understanding of the nature of science, to further develop their research skills and science identity, and to socialize them into a research community of practice.

Research projects in the **Advanced Research Program** include a collaborative summer field or laboratory project followed by an entire academic year of deeper questioning, data collection, analysis, and dissemination (Figure 1).

## II. Research Project Details

**Gateway Projects:** The ideal Gateway project is designed for nine students and two faculty directors, but we will also consider four and five student projects with one faculty director for each project. Near-peer mentors (see below) are included in the student counts. In addition to research, a typical Gateway project will involve a mix of hands-on activities, training, and mini-lectures by project directors and perhaps a visiting scientist to help introduce students to the breadth of the geosciences and to help develop the knowledge and skills needed to be successful during the five-week research project.

- 5 weeks summer
- Participants are primarily rising sophomores and relatively new to the geosciences
- Emphasis on development science identity and sense of belonging among participants
- Project Directors are typically assisted by a near-peer mentor (rising junior/senior)
- Students attend a professional conference during the following year
- Poster presentations published in the *Proceedings of the Keck Geology Consortium*

**Advanced Research Projects:** Advanced Research projects are typically designed for four-students (with one faculty director) or nine-students (with two faculty directors). These projects involve students in a collaborative four-week summer field and/or laboratory experience, followed by mentored independent work at their home campuses during the following academic year.

- 4 weeks summer
- Emphasis is on rising seniors engaged in senior capstone research
- Academic-year research is co-mentored at home institutions with campus advisor
- Students attend a professional conference during the following academic year
- Short contributions are published in the *Proceedings of the Keck Geology Consortium*

The **Analytical Skills Component** supports and supplements both types of Consortium projects (Gateway and Advanced). The goals of the analytical component are two-fold: 1) to train undergraduate students in cutting-edge analytical techniques and instrumentation, and 2) to enhance student research experiences and project science goals using analytical data. Project directors can request up to \$500 per student for analytical work. Preference will be given to projects that make use of services provided by established NSF-supported user facilities such as Laserchron, LacCore, Institute for Rock Magnetism, etc.

The **Professional Development** component is designed to support students in both Consortium programs (Gateway and Advanced). The goals of this program are to help undergraduate students deepen their professional knowledge and skills, promote the development of a science identity, knowledge of the profession, and to help clarify their educational and career plans through participation in a professional meeting. Project directors and participants travel to a regional or national conference, meet to discuss their project results, present their findings, and participate in other professional activities. Project directors will also facilitate professional development of their students at the meeting.

### III. Proposal Format and Contents

Proposals for research projects supported by the Keck Geology Consortium REU include the following sections:

- **Project Title:**
- **Project Directors:** name, institution, email for each
- **Tentative Field/Laboratory Dates**
- **Number of Students** (including near-peer mentors)
- **Total Project Budget Request**
- **Project Description:** brief introduction of goals and significance of the project
- **Student Learning Outcomes:** including scientific, professional, and developmental
- **Potential student projects** (e.g. scientific questions and potential students on each)
- **Project Logistics:** number of students, approximate project dates and location(s) for fieldwork, lab work, and conference travel, logistical and safety concerns (including precautions and alternative formats in response to COVID-19 if relevant), expectations for students (e.g. remote camping, food flexibility, gear, physical ability). Please give a brief description of the faculty committed to or interested in working on the project and their areas of expertise.
- **Analytical Components:** If your project budget includes funding for analytical work (see *Analytical Component* above), please include a statement of the type(s) of data you plan to collect, planned analytical facility, and relevance to project.
- **Professional Development Component:** Please include a description of the Professional meeting(s) that would be appropriate for your project and participants, its relevance to the project goals and student professional development, and ideas for planned/facilitated activities by the project at the meeting.
- **Budget:** Use the guidelines below (Table 1), keeping an eye on the bottom dollar amount for the project size you propose. Participant stipends should be included in the project budget, but will be paid directly by the Keck office; other project costs will be reimbursed from sub-contracts with the home institutions of Project Directors. Participant support costs (travel to site, travel at site, room and board) may be reallocated as long as the final budget does not change from the maximum amount indicated. If matching funds are available for projects that are more expensive than the budget limit, please indicate the source and use of those funds. Please justify requests funds to support analytical costs in the Budget Justification, and include an "Analytical Component" line in your budget. Participation in a regional or national meeting is encouraged and Professional Development funds (\$1225 per student) are available; please justify and include an "Professional Development" line in your budget. Note that the total amount of funding available for meetings is calculated on a per student basis; e.g., a nine student project can spend up to \$11,025 (9\*\$1225) for all project personnel.
- **Budget Justification**

**IV. Submitting a Proposal** Proposals will be accepted at anytime, however, we are especially interested in receiving proposals before the annual GSA meeting. While you do not need to have commitments from project faculty when you submit a proposal, it is best to have faculty in place if at all possible. Typical proposals are five to seven pages in length, including figures, tables, and references. Please include the budget on a separate page.

Please send a copy of your proposal (as a PDF) to Cam Davidson (c davidso@carleton.edu) AND Karl Wirth (wirth@macalester.edu).

**Table 1. Example Budgets for Keck Geology Consortium Projects**

Below are example budgets calculated on a per student basis using the maximum unit costs (shown). Show actual costs in your budget and explain in the Budget Justification. The ratio of students to directors should be greater than 4:1.

**Gateway Project Budget (9 students)**

Costs Paid by Keck Office			
<b>I. Stipends</b>	Unit Cost	no.	Total Budget
Project Director(s)	\$6,500	2	\$13,000
Students (8 participants & 1 near-peer mentor)	\$3,000	9	\$27,000
Costs Paid by Sub-Contract to Host Institution			
<b>II. Travel</b>			
Faculty to site	\$500	2	\$1,000
Students to site	\$500	9	\$4,500
At site	\$500	9	\$4,500
<b>III. Room &amp; Board</b>	\$900	11	\$9,900
<b>IV. Other Expenses</b>	\$500	9	\$4,500
<b>Total Summer Research Budget:</b>			<b>\$64,400</b>
<b>V. Analytical Component</b>	\$500	9	\$4,500
<b>VI. Professional Development</b>	\$1,225	9	\$11,025
<b>Total Project Budget:</b>			<b>\$79,925</b>

**Advanced Project Budget (4 students)**

Costs Paid by Keck Office			
<b>I. Stipends</b>	Unit Cost	no.	Total Budget
Project Director(s)	\$6,500	1	\$6,500
Students	\$2,400	4	\$9,600
Costs Paid by Sub-Contract to Host Institution			
<b>II. Travel</b>			
Faculty to site	\$500	1	\$500
Students to site	\$500	4	\$2,000
At site	\$500	4	\$2,000
<b>III. Room &amp; Board</b>	\$800	5	\$4,000
<b>IV. Other Expenses</b>	\$500	5	\$2,500
<b>Total Summer Research Budget:</b>			<b>\$27,100</b>
<b>V. Analytical Component</b>	\$500	5	\$2,500
<b>VI. Professional Development</b>	\$1,225	5	\$6,125
<b>Total Project Budget:</b>			<b>\$35,725</b>