Increasing diversity in the Geodynamics Community through Research Undergraduate Experiences (REUs)

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Members of the geodynamics community come from a broad range of backgrounds that include the earth sciences, physics, chemistry, applied mathematics, and computational science. Singularly, many of these fields alone are the least diverse in STEM (Bernard & Cooperdock, 2018). The challenges for computational geodynamics are not only to increase competency in these domains but also in recruiting from an undergraduate student pool that in itself lacks diversity. CIG has been successful in attracting women, but racial and ethnic diversity remains elusive. We propose to address both these challenges to the workforce pipeline through a CIG REU program aimed at increasing competency in the skills needed for computational modeling. Recruiting will target undergraduate domain societies of underrepresented groups in STEM, minority serving institutions, and other NSF earth science organizations. The structure, focus, and practices of the REU program will draw on previous REU leadership experiences within the Geodynamics and Geophysics communities, as well as a pilot CIG REU currently under review at NSF

To support the academic and technical goals, the REU program will focus on building computational skill sets that can be applied in both an academic and industry setting with a focus on constructing computational models in geodynamics using high performance computing. The programs would begin with a two (2) week short-course led by members of CIG Staff, community, and REU mentors. Specific sub-topics covered in the short-course could include hypothesis development from geologic observations; model design, building, and analysis; best practices in software development, and fundamentals of high performance computing. The short-course will also be available to others in the community, increasing the opportunity for the REU cohort to interact not only with each other but with a larger network of early career scientists, mentors, and role models.

An 8-10 week summer research project with mentors from the geodynamics community would follow the short-course. Mentors will be provided reference materials on best practices and be offered a specialized training on mentoring underrepresented minority students with a program of activities to encourage and facilitate interactions To encourage continued interactions among the cohort during their research project, students will participate in weekly brown bag seminars with mentors and additional community members. The seminars will focus on career pathways to becoming a scientist and providing an early intervention that counters imposter-syndrome that disproportionately affects students from underrepresented groups. Students will also be encouraged to present their project in person at an appropriate venue such as an undergraduate research fair or a professional meeting. Mentors, if appropriate, will be encouraged to help students in preparing graduate school applications.