I. Title: Securing National Prominence in Volcanology, Volcanic Hazards, and Geothermal Energy

II. Abstract:
Volcanic eruptions are spectacular manifestations of a dynamic earth, and the UO has had a strong and widely respected program in volcanology since the 1960s. With Earth’s rapidly growing population, more people and infrastructure globally are at risk from volcanic eruptions, particularly in developing nations and the Pacific Rim countries as a whole. While the effects of volcanic eruptions are felt immediately in nearby population centers, an eruption can also have global impacts that last for years. Recent examples include the 2010 eruption in Iceland that shut down western Europe’s airports in 2010 costing airlines $1.7 billion, and the 1991 eruption of Mt. Pinatubo that ejected enough gas and particulates into the atmosphere to affect global weather patterns for the next year. This is an exciting time in volcanological research because the inherently interdisciplinary nature of the field, rapidly evolving new technologies, advances in computer modeling, and emerging ability to handle very large datasets ensure that dramatic scientific advances are on the horizon. In the upcoming decades we will likely be able to make accurate, intermediate—term (hours to weeks) eruption predictions, thereby greatly mitigating volcanic hazards. Volcanic systems also have the potential to be a source of renewable geothermal energy to help sustain our nation’s evolving energy needs. With several focused hires we have a unique opportunity to “move the needle” in this area and become the top academic center for the study of volcanoes in the U.S. and one of the top 3—5 programs worldwide.

III. Proposing Faculty
Paul Wallace, Ilya Bindeman, Rebecca Dorsey, Emilie Hooft, Leif Karlstrom, Mark Reed, Alan Rempel, Amanda Thomas, Jim Watkins (all in Department of Geological Sciences)

Cluster Coordinator: Paul Wallace  Department: Geological Sciences

IV. College/Units Involved:
College of Arts and Sciences Dean(s): Andrew Marcus
Department(s): Geological Sciences

V. Number and Level of each New Position Proposed:
We have identified five research fields that we believe will be at the forefront of exciting new discoveries in volcanology over the next several decades. The first three would form the core of a world—class center focused on active volcanic processes and hazards. The last two would expand this initiative into a comprehensive program integrating volcanology with energy and resource development and a broader range of geologic hazards, and it would better connect us with other research units across campus. The first position is an existing vacant position created by the recent resignation of Kathy Cashman, and thus our proposed initiative consists of four new positions. Given our existing strengths, we anticipate that most hires will be at the Assistant Professor level. However, the program would benefit from the option of considering candidates at the Associate level for the first two positions to allow us to build critical mass more rapidly.

1. Physical Volcanology (Associate Professor): field—based studies of volcanic eruptions tied to textural and chemical studies of ash and lava and development of hazard assessment models.
2. Volcano Geodesy & Remote Sensing (Associate Professor): use of satellite and ground—based instruments for monitoring deformation of volcanoes, eruption processes, and the transport of ash and gas in the atmosphere.
3. Computational Modeling (Assistant Professor): numerical modeling to investigate the physics of volcanic plumes, pyroclastic flows, and ash deposition, with applications to human and aviation hazards.
4. Geothermal Energy (Assistant Professor): geophysical and geochemical studies of geothermal systems and their potential as energy resources, with links to industry and resource development in Oregon.
5. Radiogenic Isotope Geochemistry (Assistant Professor): cutting—edge methods for measuring ages of past eruptions to understand how volcanoes work and the effects of large eruptions on climate, Earth’s environment, and biodiversity.

Working with Cluster of Excellence proposers and participating deans, central administration will refine specific hiring plans based on available facilities, funding and institutional support structures.