

## Intellectual Merit Criterion

### Overall Assessment of Intellectual Merit

Excellent

### Explanation to Applicant

The applicant has strong research experience and numerous accomplishments. The applicant seeks to build a model that will characterize the roughness and geometry of snow surfaces. Applicant also has extensive modeling experience and seeks to take advantage of the additional computational resources that a GRF would provide access to.

## Broader Impacts Criterion

### Overall Assessment of Broader Impacts

Excellent

### Explanation to Applicant

Broader impacts are excellent and include improve the accuracy of polar climate models, communicate results to National Snow and Ice Data Center, engage local teachers, make work publicly available on a blog, and a hands-on course through CU's Science Discovery Program.

## Summary Comments

The applicant has strong qualifications and reference letters. The student is well qualified to conduct the proposed research and both statements are well written and clear.

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### Explanation to Applicant

Kelly Kochanski's proposed project is on the geometry and evolution of eolian snow bedforms, such as sastrugi, in the Antarctic. The project combines a software model for bedform evolution with empirical field data from the Antarctic and a local site in Colorado. I expect the model to be sophisticated and of the highest quality; Ms. Kochanski has a undergraduate double major in physics and geology from MIT and has extensive experience in modeling and programming. She has also had direct field experience and data gathering in the Himalayas, Alaska, and the Mohave, so she combine superb technical skills with empirical knowledge. She has presented her Alaska research at AGU. I am confident the current project will present high quality results of broad interest.

## Broader Impacts Criterion

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Excellent

### Explanation to Applicant

The applicant has an exemplary record in outreach. She went to Santiago, Chile to work with students in two public schools and is planning to use this as the basis for a new hands on course for students near the University of Colorado. She has also given outreach lectures and maintains a very attractive blog.

## Summary Comments

Ms. Kochanski is a superb candidate for the GRFP. She excels in both of the main criteria.

## Intellectual Merit Criterion

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### Explanation to Applicant

This applicant proposes to build a model to characterize the roughness, geometry and evolutions of Aeolian snow bedform. The proposal will use direct observations from two test sites, one in Antarctica and another one in Colorado, to test several hypotheses related to snow bedforms. The proposal is very well organized, with research aim, testable hypotheses and needed resources clearly articulated. The applicant has a strong academic background with nearly perfect GPAs from MIT, and has gained several research and field experience in the past. In addition, the recommendation letters were also very strong.

## Broader Impacts Criterion

### Overall Assessment of Broader Impacts

Excellent

### Explanation to Applicant

The proposed work would help to reduce uncertainties in polar climate models, and hence could help to better predict the effects of climate changes on sea ice melts. The applicant plans to find multiple ways to make the work publically available via online blog and local teachers. Finally, the applicant plans to teach research skills to high-school teachers. All these activities help to promote science to general public, as well as helping training teachers for bringing STEM to future generations.

## Summary Comments

This is a very strong proposal that deserves the highest priority of support. The applicant has ample research experience in the past, strong academic background, and support from the university and advisors to assure success in the proposed work.