

## EXPLORATION IDEA PROFILE: Crowdsourcing Earth's Rotation

### EXPLORATION IDEA

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Earth's rotation causes the surface acceleration near the equator to be slightly less than at the poles due to the contribution of the centrifugal force and the deformation in the shape of Earth. This latitude-dependent difference is about  $0.05 \text{ m/s}^2$ , and is detectable near the limits of ordinary smartphone technology. This informal science investigation will crowdsource the data from thousands of participants to measure this effect, which has implications for formal educators as well as a 'just for fun' investigation by the general public.

### TARGET AUDIENCE(S)

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It could impact formal education science and mathematics classes, as well as physics and astronomy undergraduates interested in exploring quantitative observation with ordinary smartphone sensors.

### POTENTIAL IMPACT

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This is a Citizen Explorer project designed to bring the public into contact with some of the methods of more formal Citizen Science projects. The creation of this project greatly increases the numbers of people who become aware of the sensor suites in smartphones and how to creatively use them to further their scientific curiosity.



### RELATED IDEAS/INNOVATIONS

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- Develop a mobile interface for Android and iPhone cell phones

### MATERIALS/EQUIPMENT

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- A variety of smartphone models to calibrate the various accelerometer sensors and apps

### EXPLORATION IDEA TEAM

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- **Team Lead:** Dr. Sten Odenwald (NSSEC)
- **Affiliated Contributors:** Afriel Zych (Science Friday), Cait Bailey (Anecdata)
- **Team Members:** Thousands of individuals; dozens of schools

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*Exploration Idea Profiles* are developed through a guided process involving a step-by-step guide/worksheet where participants are invited to consider additional topics that include:

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- Connections to other technologies
- Connections to existing information/research
- Connections to educational standards
- Connections to existing activities/projects
- Universal design
- Next steps

## ***HOW TO CONNECT***

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