

## ABSTRACT

Many countries face significant challenges in attracting, retaining and diversifying the workforce in the geosciences. In the U.S. likely contributing factors include the homogeneity of the pool of mentors/role models available both within the workforce and in the professorate. Another probable factor is “exposure gaps” among student populations; i.e., differing access to engaging facets of science, technology, engineering and mathematics (STEM). To address these challenges, the authors have created a set of NSF-funded programs. The **STEMSEAS** program recruits undergraduates from diverse backgrounds and institutions to sail on research vessel transits in the U.S. Academic Fleet – giving them relatively short, but transformative experiences at sea.

For educators, the International Ocean Discovery Program (IODP) utilizes transits and tie-ups of the scientific ocean drilling vessel *JOIDES Resolution* (JR) to provide professional development for educators based on the science and technology of science drilling. These **School of Rock** programs have been implemented since 2005.

A sister program, **Ambassadors for STEM Training to Enhance Participation (A-STEP)** works with more upper-level undergraduate and graduate students to leverage both STEMSEAS and School of Rock. In particular, ASTEP participants take part in both STEMSEAS and/or School of Rock programming, and then build on these experiences to create outreach materials and presentations to share with diverse communities afterwards.



Students and instructors on the R/V Atlantis STEMSEAS transit

## INTRODUCTION

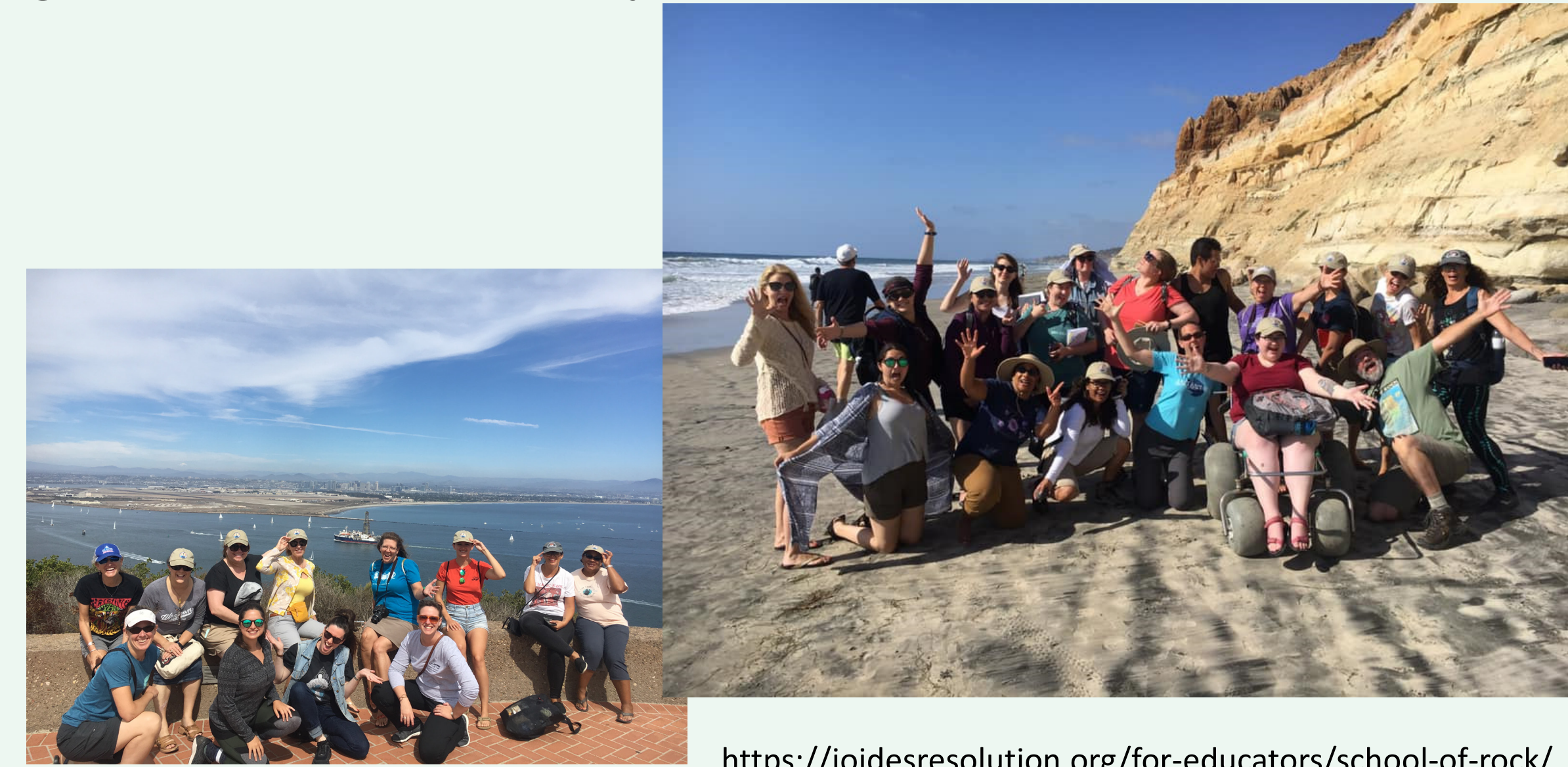
Ambassadors for STEM Training to Enhance Participation (A-STEP) is a new program with these overarching goals:

- Increase ocean science experiences for diverse graduate and undergraduate students
- Leverage IODP School of Rock and STEMSEAS transit participation
- Emphasize science communication to broad audiences via educational modules, classroom visits, multimedia products



## IODP School of Rock

Educational partnerships, teaching and mentoring opportunities, bolstering diversity in STEM, expanding geoscience pathways



<https://joidesresolution.org/for-educators/school-of-rock/>



## 2019 Participants and Outcomes to date

A-STEP Cruise Participants	R/V <i>Armstrong</i> MA to Iceland	R/V <i>Atlantis</i> Oregon to CA	JR San Diego (shore-based)
Sophomore (1)	Univ of Colorado		
Junior (2)	Northeastern Univ	Univ of FL	
Senior (3)		Univ of NM	Univ of CA, Berkeley Montclair St U
Graduate (2)			CSU, Northridge Stanford Univ



A-STEP Cruise Participants	R/V <i>Armstrong</i> MA to Iceland	R/V <i>Atlantis</i> Oregon to CA	JR School of Rock (shore-based)
Sophomore (1)	Student attitudinal survey; AGU Ocean Sciences poster		
Junior (2)	Student survey, K-12 visit; AGU poster	AGU Ocean Sciences poster	K-12 classroom visit
Senior (3)		SACNAS poster presentation, recruiting ambassador	SACNAS poster recruiting, geo club, K-12 visit
Graduate (2)			Geoclub, tutor

## NEXT STEPS for 2020 (schedule prior to COVID disruptions, will be reconfigured)

### STEMSEAS

**10 July – 15 July** Sail on *R/V Sikuliaq* from Seattle, WA to Seward, AK

**11 July– 17 July** Sail on *R/V Hugh Sharp* from Gulfport to Lewes, DE

**9 August – 13 August** Sail on *R/V Neil Armstrong* from Galway, Ireland to Reykjavik, Iceland (must have U.S. passport)

**25 Aug – 30 August** Sail on *R/V Marcus Langseth* from Ketchikan, AK to Dutch Harbor, AK

**School of Rock on the *JOIDES Resolution***  
TBD

<https://astep.berkeley.edu/about/>



## STEMSEAS

*STEM Student Experiences Aboard Ships*

- 7-10 day cruises for diverse undergraduates
- NSF-funded research vessels, US (UNOLS) academic fleet of ships
- Emphasis on geology and oceanography

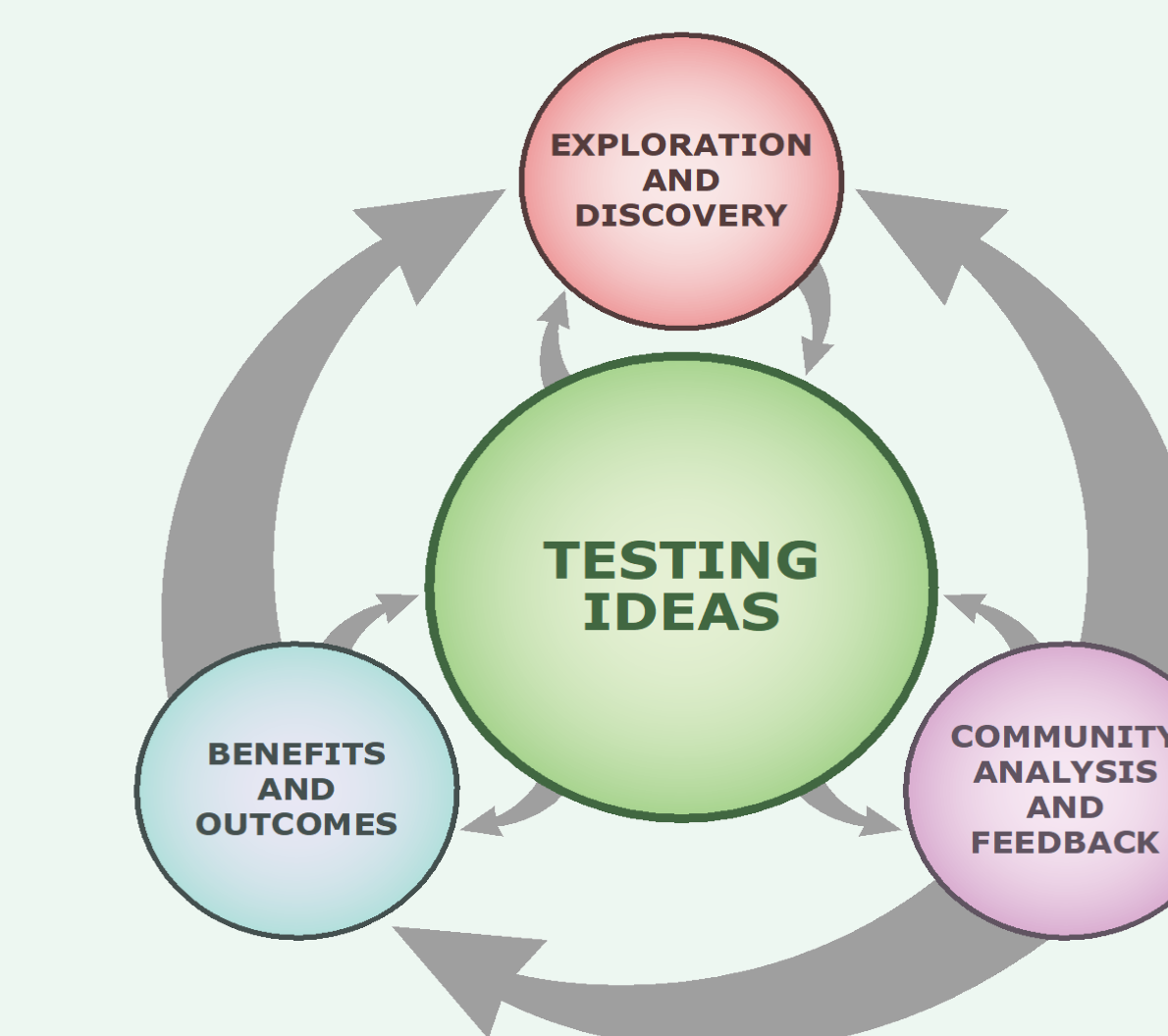


[www.stemseas.com](http://www.stemseas.com)



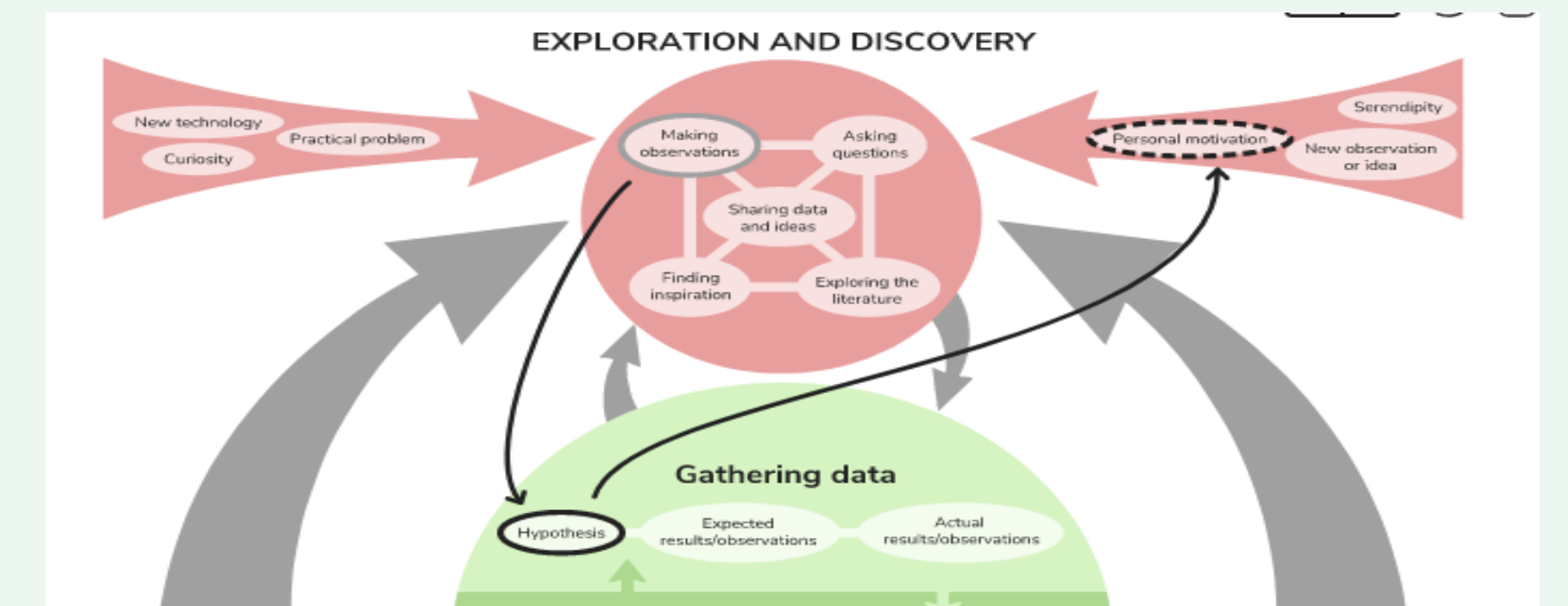
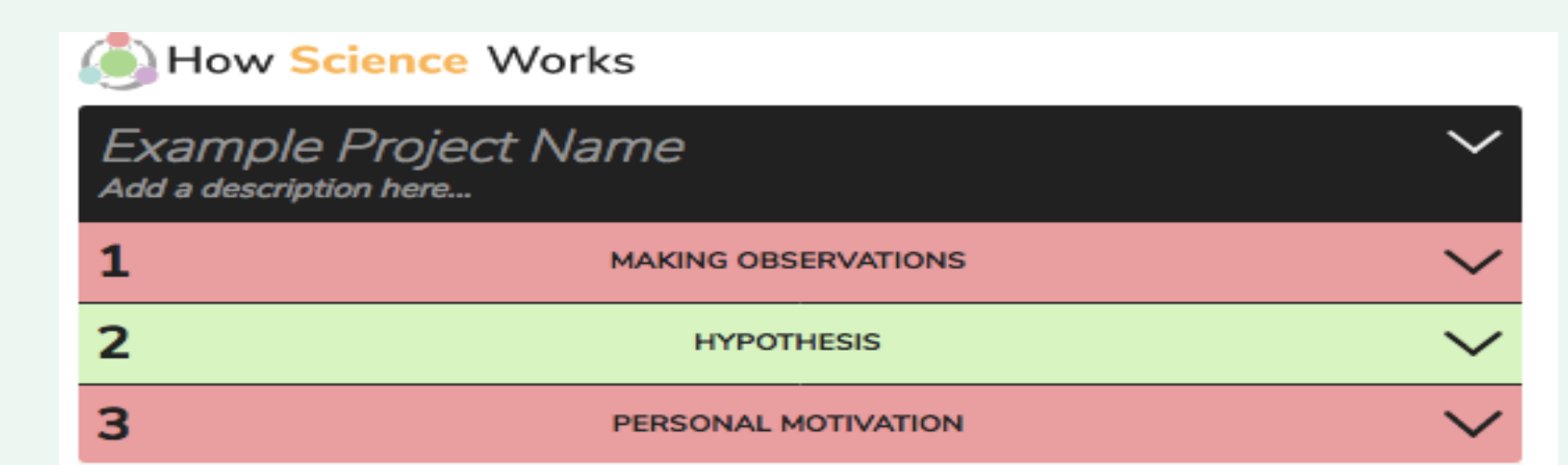
## Opportunity to use University of California Museum of Paleontology Interactive Journaling Tools

### How science works



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<https://undsci.berkeley.edu/interactive/#/intro/1>



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