



S-STEM REC

The deadline to submit a research poster abstract is June 15, 2023, at 11:59 PM ET.

S-STEM Scholar Research Posters
Submission link: <https://forms.office.com/r/nRLNYp1niZ>

We are excited to provide the opportunity for S-STEM Scholars engaged in research to showcase their work through research poster presentations. We will look to accommodate as many submissions as possible within our space restrictions. Submissions are limited to 1 abstract per scholar. Scholars must be registered to attend the meeting.

You will need your 7-digit NSF S-STEM program award number when submitting your poster abstract. Please have this information beforehand. Please consult your faculty member if you are unsure of the NSF S-STEM project award number.

Research Poster Submission Process:

We recommend preparing the following in a document ahead of submitting a poster abstract.

- Title (100 characters or less, including punctuation and spaces)
- Discipline Area
- Co-Authors
- Abstract (3,000 characters or less, including punctuation and spaces)
- Acknowledgement of Funder(s)
- Faculty Advisor/Mentor Approval

Abstract Submission Development Guide and Sample Abstract

Title: The abstract title should be no longer than 100 characters (including spaces and punctuation), initial capped, and not in a sentence format.

Example Title: Support for the Inverse of Bergmann's Rule in Slevin's Bunchgrass Lizard

Discipline Area (select one):

- Agricultural Sciences
- Biological Sciences
- Chemistry or Chemical Sciences

- Cognitive Sciences, Neuroscience, or Psychology
- Computer/Information Sciences
- Geoscience or Environmental Sciences
- Economic Sciences
- Engineering Sciences
- Mathematics or Statistics
- Physics or Astronomy
- Other (Please describe)

Co-Authors: Please indicate all co-authors names and institutional affiliations. If there are no co-authors, leave this field blank.

Example Co-Author: Jane Smith, University Name

Abstract**: Abstract text should be no longer than 3,000 characters (including spaces and punctuation), and must include the following:

- Hypothesis or statement about the problem being investigated and why the research is important
- Methods and controls
- Results and discussion of findings
- Conclusions and future research questions
- Key references

**Please note: Your abstract should NOT include embedded images or charts and graphs. If your abstract includes symbols, notations, or mathematical equations we ask that you also upload a copy of your abstract in word format during the submission process.

Example Abstract:

Bergmann's rule is an ecogeographic principle postulating an intraspecific increase in body size with increasing latitudes or increasing elevation, each correlating with decreasing environmental temperatures. The influence of body size on thermoregulation is the primary physiological basis for this rule. A decreased surface area to volume ratio of larger body size increases an animal's ability to retain heat and sustain internal temperature. There is general support for this rule in homeotherms (e.g., birds and mammals) which maintain body heat through metabolism. The application of Bergmann's rule to ectotherms (e.g., reptiles) which acquire heat via thermoregulation, remains controversial. Larger body size in ectotherms should be selected in cooler environments because of the increased time necessary for heat absorption to carry out daily functions when compared to smaller sized conspecifics.

However, research on a number of spiny lizards (genus *Sceloporus*) show support for Bergmann's rule. We use Slevin's bunchgrass lizard, *Sceloporus slevini*, a species that occurs at both high and low elevations to test the hypothesis that ectotherms should show a reversed size relationship than the one hypothesized by Bergmann's rule. Body size measurements to the nearest 0.01 mm were taken using

digital calipers from five populations from high, mid-range and low elevations in southeastern Arizona. Body size at different elevations was compared using a one-way ANOVA and pairwise differences in means were evaluated using Tukey's multiple comparison tests (when the overall ANOVA's were significant). Our findings demonstrate a significant size difference between high and low elevation populations. The mean body size (snout-vent length) of individuals at higher elevations was significantly smaller than conspecifics at lower elevations ($F_{4,100}=5.40$, $p=0.001$). These results indicate an inverse correlation to Bergmann's rule. Rapid thermoregulation in ectotherms, achieved by decreased body size and increased surface to volume ratio, supports a physiological explanation for this phenomenon. Future research involves understanding the interaction of factors such as sexual selection on male body size and female fecundity, factors that may help explain why all ectotherms don't follow the inverse of Bergmann's rule.

References: Angilletta, M.J., Niewiarowski, P.H., Dunham, A.E., Leache, A.D. & Porter, W.P. 2004. Bergmann's Clines in Ectotherms: Illustrating a Life-History Perspective with Sceloporine Lizards. *American Naturalist*. 164(6):168-183.

Ashton, K.G. & Feldman, C.R. 2003. Bergmann's Rule in Nonavian Reptiles: Turtles Follow It, Lizards and Snakes Reverse It. *Evolution*, 57:1151-1163.

Bergmann, C. 1847. *Über die Verhältnisse der Wärmeökonomie der Thiere zu ihrer Grösse*. *Gottinger Studien*, 3:595-708.

Acknowledgement of Funder(s): Please list the funder(s) of the research project. If there is more than one funder, each should be listed separately.

Example Funder Acknowledgement: This study was supported, in part, by a grant from NSF/AAAS awarded to John Doe PhD, Director for the Center of Biotechnology and Biomedical Studies, University Name, Washington, DC.

Advisor/Mentor: Abstracts must be approved by the student's faculty advisor or mentor. Please indicate the name and email address of your advisor here, indicating their approval of your abstract submission.

Example Faculty Advisor/Mentor: John Doe, jdoe@universityemail.edu

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Poster Dimensions and Set-Up Procedures:

1. The poster size should be no larger than 4 feet by 4 feet (*i.e., length is no more than 4 feet and the width is no wider than 4 feet*). Oversized posters will obscure an adjacent poster.
2. Presenters will be assigned a specific time slot and numbered space for their poster presentation. (*Presentation schedules will be posted online prior to the meeting.*)
3. AAAS staff will provide poster boards and push pins for mounting posters and will be available to assist scholars with locating their assigned poster space.
4. Scholars have until **June 15 at 11:59 p.m. ET to edit their poster abstracts.**