



# Community Spotlight

Each [Community Spotlight](#) features an outstanding group, partner, resource, or member of our community.

## Community Spotlight: Brian Winkel with SIMIODE

Written by Tessa Gatz, BioQUEST Communications Manager | April 2024

When Brian Winkel, SIMIODE director and founder, first reached out to me, it was in response to the most recent BioQUEST/QUBES newsletter. He shared his own tales of travel adventures. “Adventure” puts it lightly – more like life-changing experiences in which he and his family (children aged 8 & 10) were dropped off in the wilderness of Wyoming, with no other interactions as they trekked their way back out. He said it was the best time of their lives. In fact, they did it two more summers after that. To note, his first exposure to Wyoming was through a Wilderness Education grant with an ecologist at his college.

This was an excellent introduction to Brian’s style in life including his teaching career – driving real-world situation experiences for knowledge, growth and connection. Brian’s background is vast and filled with more experience and accolades than can be listed. He is the Founding Editor of *Cryptologia* and *PRIMUS*, two journals freely offered by the Mathematical Association of America. His titles include Director, Founder, Professor, Editor, Retiree, Doctor, Mentor as well as Dad and Husband, to name a few. Included in this (as mentioned above) is Brian’s role as Director and Founder of SIMIODE, which resides in [the QUBES platform](#).



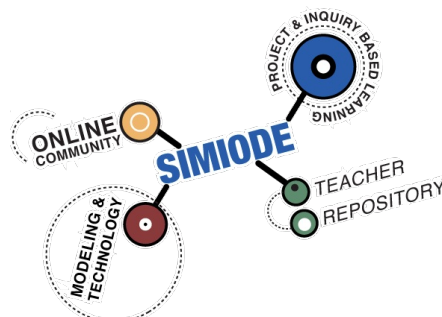
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## ABOUT SIMIODE

Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations (SIMIODE) is a non-profit, open community established over a decade ago. SIMIODE champions the teaching and learning of STEM mathematics differential equations in context through modeling. In a nutshell: the real-world application comes first, leading to learning and understanding the mathematical modeling strategy and then actual mathematical skills and applications.

The [SIMIODE community](#) consists of teachers and students who seek to focus on differential equations to solve real-world problems. SIMIODEans believe this order lends a better understanding of the workings of the world and phenomena around us.

Moreover, the research literature shows that a modeling-throughout approach works to enhance learning. The traditional solution technique approach often gives little motivation as to why one would want to solve, let alone study, differential equations.



## How can the resources included in SIMIODE help educators and/or students?

In addition to the QUBES community, SIMIODE hosts workshops, team events and even an annual conference, which occurred this February. SIMIODE offers hundreds of modeling scenarios and resources – all are openly-licensed, downloadable and can be modified. All modeling scenarios and technique narratives published in SIMIODE offer a student and an educator version, the former offering sufficient materials for students to create and validate mathematical models, while the latter offers advice on using material and solution strategies. Many materials also support further exploration.

### STEM Education Reform

When asked when Brian got involved with STEM education reform, he simply stated, “before there was the word STEM”. In the early 1970s, his curiosity pushed him into all things applied about the mathematics he was teaching, laying the foundation for a lifelong dedication to transformative learning and teaching practices. I asked Brian what advice he would give to someone interested in getting involved with STEM education reform and he said, “Try it! Take it one step at a time. Do not try to do too much at the start. Work with a collaborator (or two) or get involved with a community such as SIMIODE and attend workshops and paper sessions”. He recommended bringing back a few of the ideas (not all!) and putting them into practice in your coursework. He ended with, “The reward of seeing students grow in skills, enthusiasm, self-efficacy and just joy in seeing how mathematics can be involved makes it all worthwhile.”

The joy of experiencing and learning in life, whether through memorable wilderness treks, guiding the application of mathematics to real-world problems or any journey in between is certainly all worthwhile.

Contact Brian on [QUBES Platform](#) or via email at [BrianWinkel@simiode.org](mailto:BrianWinkel@simiode.org).



## TOOLS FOR THE COMMUNITY:

- **OERS:** Immerse yourself in hundreds of open educational resources (OERs) [available on SIMIODE's QUBES community](#). Downloadable, modifiable modeling scenarios using differential equations, many in the life sciences, are available.
- **EXPO Programs & Slides:** Visit [SIMIODE EXPO 2024](#) to learn about our conference that occurred in February supporting modeling-first approaches and two exciting keynote speakers on the constructive uses of AI in teaching. See the program and slides on [QUBES](#) and [SIMIODE's YouTube Channel](#).
- **Modeling Textbook:** Help spread the word about SIMIODE's well-reviewed, modeling-first [textbook](#) to colleagues.
- **Student Team Presentations:** See all the SIMIODE Challenge Using Differential Equations Modeling (SCUDEM) VIII 2023's Outstanding Award Student team presentations at the [SIMIODE YouTube Channel](#) and learn more [here](#).



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