

## Volume VI Number 3

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### WELCOME TO SIMIODE AND OUR NEWSLETTER

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We apologize for the lateness of this issue, but in the current health crisis you know the situation in which we all find ourselves. Nevertheless, we are here for you and share our own passion for the excitement of modeling in differential equations coursework. We wish you health, safety, and comfort in your passions.

SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations offers a Community of Practice for teaching differential equations using modeling and technology upfront and throughout the learning process. Learn more at our dynamic website, [www.simiode.org](http://www.simiode.org).

Please drop us an email to [Director@simiode.org](mailto:Director@simiode.org) and let us know what you value in SIMIODE and how we can improve SIMIODE and this Newsletter. If you have an idea for coverage you would like us to publish in the Newsletter then let us know or perhaps write up an "item" for our next issue.

We recognize that most are attempting to engage in these traumatic, but opportunity filled, times in the era of the pandemic and we would welcome your sharing your experiences and engaging colleagues in conversations about distance, online, virtual, ether, one-on-one, etc. teaching experiences. Current conversations find faculty planning for more of the same in the fall and using their summer time to better prepare. Join our Forums in our **Community of Practice** section of SIMIODE and get new ideas and shared experiences. Post news of your efforts and discoveries.

SIMIODE is a 501(c)3 nonprofit organization, based in Cornwall, New York in the United States.

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### SIMIODE RECEIVES GREAT SUPPORT

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SIMIODE continues to **receive the support** of the Division of Undergraduate Education of the National Science Foundation for which we are most grateful.

SIMIODE is benefiting immensely from extensive consulting services and hands-on help from **Science Gateways Community Institute - SGCI** in areas such as User Experience, Sustainability, Technical Enhancements, Analytics, Social Media, and Student Interns.

SIMIODE is planning to move to the broader HUBZero community at **QUBESHub** by December 2020 to benefit from QUBES' hosting expertise while continuing to offer ALL of SIMIODE's features and resources. To this end we have received a grant from the **William & Flora Hewlett Foundation** through the SCORE organization at Bates College, Lewiston ME USA.

We are most grateful to these organizations for helping us bring SIMIODE to you.

Of course individuals can contribute their support to SIMIODE through our **DONATE Program**.

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### REMOTE TEACHING MODULES AND CONVERSATIONS COMING

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We have prepared a number of **Remote Teaching Modules** for your use in the fall and beyond. These contain off-the-shelf materials for your students, videos, lesson activities, modeling opportunities, and rich learning opportunities for all. Later in the summer we will host several Q&A sessions concerning these materials and share details with you.

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### ACTIVITIES USING DATA - RICH AND IMMEDIATE

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We have also posted **SIMIODE Immediate Activities Using Data** for Students Learning On Line. These are exciting Modeling Scenarios with data or easy data collection engagements to enhance and enrich the modeling experience. Check them out!

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### SIMIODE EXPO - 12-13 FEBRUARY 2021

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We are planning an online meeting, SIMIODE EXPO, for 12-13 February 2021, in which real-time, face-to-face meeting activities will be offered through the marvelous opportunities afforded SIMIODE at [mathdept.org](http://mathdept.org). SIMIODE EXPO will feature minicourses/workshops, contributed paper sessions, birds of a feather gatherings, working opportunities to develop your own materials, one-on-one "hallway" meetings and conversations, your own avatar(!), "handout" materials, and just about everything a real meeting could offer, only SIMIODE EXPO will be virtual and available without travel and budget breaking costs. Imagine SIMIODE's international meeting right in your home or office and the chance to meet others of like mind. We are in the early planning stages, so stay tuned for details and mark your calendar.

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## SCUDEM V 2020 - GOING VIRTUAL AND VIRAL

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SIMIODE Challenge Using Differential Equation Modeling - SCUDEM V 2020 is going virtual. Key features include:

- teams of three high school or undergraduate students will select one of three area problems (physics/engineering, chemistry/life sciences, humanities/social science) to work on during the period 23 October -14 November 2020 and upload 10 minute video presentation for judging;
- teams can consist of students from one school or many schools (SIMIODE will facilitate team formation from individual student and mentor/coach registration);
- imagine having a mentor/coach from Kyoto JAPAN and team members from Sacramento CA USA, Brno CZECH REPUBLIC, and Lagos NIGERIA -- WOW!;
- team and individual student and mentor/coach registration opens 1 September 2020.

Be sure to check out the [convincing videos](#) in which students and faculty share their enthusiasm and experience in engaging in modeling with differential equations in SCUDEM events past. You can see all the previous events' problems and all student submissions for each year of SCUDEM.

There are no registration fees for SCUDEM V 2020 in developing countries and there is modest \$10US registration for all other individuals.

We invite all to visit and join the [Facebook Group - SCUDEM Mathematical Community](#) to see more joy in modeling with differential equations.

See the results of our [SCUDEM Lite 2020](#) in which 8 teams produced impressive videos for judging this March in a prelude to SCUDEM V 2020 going virtual.

In our [12 July 2019 Blog](#) we highlighted the results from a recently published article, "Building mathematics self-efficacy of STEM undergraduates through mathematical modelling," in the *International Journal of Mathematical Education in Science and Technology*, in which the authors conclude that SCUDEM increases students' self-efficacy in mathematical modeling. Do SCUDEM for your students!

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## PLANNING FOR SIMIODE ONLINE HYPERLINKED TEXT - SEEKING YOUR INPUT

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Kurt Bryan, Rose-Hulman Institute of Technology, Terre Haute IN USA, will author a **hyperlinked text in SIMIODE which will bind resources so faculty can teach a complete differential equations course motivated by modeling**. Dr. Bryan (with co-author Tanya Leise, Amherst College, Amherst MA USA) has authored several pieces in *SIAM Reviews* over the years. For example they explain "[The \\$25,000,000,000 Eigenvector: The Linear Algebra behind Google](#)". He has also authored (with Allen Broughton, Rose-Hulman Institute of Technology) *Discrete Fourier Analysis and Wavelets - Applications to Signal and Image Processing*. The text will have the traditional topics flow, but will be rooted in modeling as a motivation and teaching approach with links to SIMIODE and other resources. We expect the text to come on line in 2021.

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## PUBLISH YOUR CLASS EFFORTS IN SIMIODE

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If you are teaching differential equations of some sort you have probably written and assigned projects. Consider publishing your materials online in SIMIODE.

SIMIODE maintains a double-blind, peer-review process for quality online publication of Modeling Scenarios and Technique Narratives. We encourage authors to submit their ideas at any stage of development and/or class projects for immediate feedback of a less formal nature. We will render constructive support and encouragement as well as technical feedback. In the past the SIMIODE Director, Brian Winkel, as Founding Editor of the journal *PRIMUS*, found this to be a very good way to foster confidence, help prospective authors contribute to the broader community, and get their ideas published. Please drop us a note with your ideas and/or materials to [Director@simiode.org](mailto:Director@simiode.org). We will respond quickly!

You can see how to submit your materials [here](#). What you do is important to your students, but it is also worthy of sharing with colleagues and their students. Step up and write up your projects for SIMIODE. You will have an online refereed publication at SIMIODE. You will be pleased to know others are using your ideas, building on your success, and enjoying what you share with your students. So, what are you waiting for? Just do it!

One purpose of SIMIODE is to offer colleagues solid, refereed teaching material on which they can base a modeling first course in differential equations. Thus publishing your new ideas and activities for students is a main objective of SIMIODE so others can see your fine work and engage their own students in similar manner.

However, it is reasonable to ask yourself, "Why should I prepare, submit, and publish in SIMIODE?" We give you **many good reasons to publish in SIMIODE**. Check them out and

see that many fit you. Then join us by sending us your efforts.

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## NEW MODELING SCENARIOS IN SIMIODE

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Just go to "**What's New**" in the Resources tab on our home page. Follow the trails and enjoy.

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## SIMIODE SOURCES FOR YOUR OWN MODELING SCENARIOS

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SIMIODE offers many **potential modeling scenario ideas**. There are now over 500 of these!

These are materials, thoughts, pointers, summaries, articles, etc. to encourage and support your modeling scenario ideas. Consider these ideas and use them to design your own modeling scenarios for your students and then publish this material in SIMIODE.

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## WORDS FROM THE DIRECTOR

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We thank you for being a part of our SIMIODE Community of Practice and hope that you are well, safe, and engaged in your passions. As always please let us hear from you with your concerns, your news, and your activities. Contact us at [Director@SIMIODE.org](mailto:Director@SIMIODE.org).

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