# SIMIODE Newsletter April 2019

# Volume V Number 2

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## WELCOME TO SIMIODE AND OUR NEWSLETTER

SIMIODE - Systemic Initiative for Modeling Investigations and Opportunities with Differential Equations is about teaching differential equations using modeling and technology upfront and throughout the learning process. Learn more at our dynamic website, www.simiode.org. SIMIODE is now entering its sixth year as a community, its second year of National Science Foundation funding, and the fifth year of this newsletter. Time flies when you are having fun!

SIMIODE is a 501(c)3 nonprofit organization, based in Cornwall, New York in the United States. Contact: Director@SIMIODE.org.
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## SIMIODE IS A COMMUNITY OF PRACTICE

We are pleased to announce that SIMIODE is a Community of Practice in the broad sense as defined by Etienne and Beverly Wenger-Trayner. SIMIODE is more than a set of resources and ideas for using modeling to motivate and teach differential equations. SIMIODE is Community and welcomes conversations, blogs, and exchanges about practices, examples, experiences, materials, stories, student feedback, successes and improvements, and much more. Join us at SIMIODE Community of Practice and engage in meaningful conversations and exchanges.
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## NSF FUNDED SUMMER 2019 DEVELOPER AND PRACTITIONER WORKSHOPS

SIMIODE invites applications for SIMIODE Summer 2019 Workshops Sponsored by the National Science Foundation and SIMIODE, July 2019, at George Fox University, Newberg OR USA

Registration is open until 1 May 2019 or until 20 spots are filled! SO do not delay if you are interested.

18-21 July 2019 4-Day Intensive SIMIODE Developer's Workshop

Those with experience and ideas for writing differential equations modeling scenarios for classroom use are encouraged to apply. DEMARC (Differential Equations Model and Resource Creators) Fellows who are selected for this workshop are fully funded, including travel up to $600, room & board, and a stipend up to $600. Applicants are asked to provide evidence of successful modeling scenario development. The workshop will provide training and support for creating new modeling scenarios.

21-26 July 2019 5-Day SIMIODE Practitioners Workshop

Ideal for those who would like to learn more about how to foster a modeling-first approach in the classroom. Workshop includes hands-on demonstration, group discussions, and activities facilitated by experienced faculty. MINDE (Model INstructors in Differential Equations) Fellows selected for this workshop have a $300 registration fee and are provided all materials and room and board for 5 days.

Complete information and application process for respective workshops can be found here: **DEMARC** and **MINDE** .
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## SCUDEM IV 2019 SEEKS HOST SITES

SCUDEM IV 2019 will take place in local sites around the world on 9 November 2019. We are seeking local site host coordinators for this event. SCUDEM, which stands for SIMIODE Challenge Using Differential Equation Modeling, offers teams of three undergraduate or high school students three modeling problems. Each team selects the problem of their choice and works on it for a week before Challenge Saturday, 9 November 2019. Student teams with their coach travel to a local site (your school perhaps) near their home campus for a day of collegial sharing. Here they submit an Executive Summary for judging, work on an additional feature for their problem, participate with faculty in an active use of SIMIODE Modeling Scenarios during a first portion of a Faculty Development program,

enjoy the fun of team MathBowl, make a 10 minute presentation of their model results, and get immediate feedback on their work by faculty judges.

Faculty coaches and other members of visiting faculty participate in a two part Faculty Development workshop in which they experience (with students) SIMIODE Modeling Scenarios and discuss using modeling in their differential equations course. During the closing ceremony awards (Outstanding, Meritorious, and Successful) are presented.

Host sites receive a check of one half the visiting teams' $100 US registration fees in support of their hosting, while SIMIODE provides ALL materials for success on Challenge Saturday. In addition, host site teams are refunded their own registration fees. SIMIODE provides massive email lists (over 85,000 mathematics faculty members) for local invites, recruiting letter materials, and an attractive flyer which can be personalized to help bring teams to the local campus site for SCUDEM. We have a complete Local Site Host Coordinator Guide and a special Group in SIMIODE for hosts to keep them informed and permit sharing of helpful ideas and approaches.

Team registration opens on 1 September 2019.

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.

There are no registration fees for SCUDEM IV 2019 in developing countries. This is our way of reaching out and supporting colleagues from these regions.

We invite all to join the Facebook Group - SCUDEM Mathematical Community.
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## PUBLISH YOUR CLASS EFFORTS IN SIMIODE

If you are teaching differential equations of some sort you have probably written and assigned projects. Consider publishing your materials online in SIMIODE using our peer reviewed, double blind referee system.

SIMIODE maintains a double-blind, peer-reviewed process for quality online publication of Modeling Scenarios and Technique Narratives. However, 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. 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 new ideas and activities for students is a main goal of SIMIODE.

However, it is reasonable to ask yourself, "Why should I prepare, submit, and publish in SIMIODE?" Here 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.

Recent published efforts in SIMIODE include these exciting examples for motivating student learning.

5-090-S-SolidParticleErosion by industry engineer and mathematician Rich Laverty offers a tutorial on the mechanics and mathematics of how small particles like sand can pit surfaces like helicopter blades.

7-011-Text-S-CoupledSystemLaplace by Mitaxi Mehta of Ahmedabad University, Ahmedabad INDIA discusses a coupled system and uses of Laplace transforms.

1-005-Text-S-NavigatingNumericalMethods by Corban Harwood of George Fox University, Newberg OR USA, guides a discovery-based approach to learning the basics of numerical methods for first order differential equations, motivated by velocity field and dead reckoning navigation over two dimensions to locate a ship lost at sea.
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## COMMENTS HELP CREATE COMMUNITY AT SIMIODE

For each Resource posting in SIMIODE community members have the opportunity to post COMMENTS. This is strongly encouraged as it will build conversations which will connect colleagues, improve material, and foster community. Any posted Comment will be emailed to the author of that resource and conversations can then begin.

Giving feedback, reactions, and corrections to authors is very important for the individual author and the wider SIMIODE community. If you visit and scan/read or actually use a Modeling Scenario or Technique Narratives please offer comments. You may even wish to upload a new resource which has significant added-value. If so then contact Director@simiode.org to inquire how you can do this. We would welcome such efforts.
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## SIMIODE IS A 501(C)(3) TAX EXEMPT ORGANIZATION - PLEASE SUPPORT US

SIMIODE is a 501(c)(3) tax exempt organization and can accept tax deductible contributions from individuals, corporations, and foundations.

Think of your differential equations course and how applications and modeling would have been so beneficial to motivate you and your fellow students. SIMIODE is your chance to support this approach for students now. You can see students value this approach in our SCUDEM videos Join us and contribute your support, financially and intellectually.

As a mathematics education organization we are open to receiving public support. In fact, we need this support to exist, so please contribute. You can contribute financial support for SIMIODE in whatever amount you feel appropriate at Donate. See our Mission Statement for reasons why you should support SIMIODE. All contributions are tax-deductible. For ANY contribution we will send you a letter of appreciation, acknowledging your contribution, for tax purposes. Please provide your email for this letter. Thank you.

You may confirm our NonProfit status at the official listing of SIMIODE in the IRS Organization List of NonProfit Organizations.
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## WORDS FROM THE DIRECTOR

We are proud to announce that SIMIODE received the 2019 MERLOT Mathematics Classics Award, with this citation, "SIMIODE has a vast collection of materials in differential equations including reading materials, videos, and step by step guidelines to complete modeling scenarios. The collection is useful for both homework assignments and project-based explorations. In addition to all of this, the site includes a blog and communication tool so that students can communicate and receive feedback from each other."

SIMIODE is a community which is alive, vibrant, and rich in resources and individual talents to assist colleagues who wish to teach differential equations using modeling to motivate students.  There are a number of ways you can add to the community:

**Contribute materials**.  You can learn more about this at our Author Information section and get even more details once you have signed into SIMIODE. There you will find types of materials and instructions on how to contribute and begin the process leading to publication in SIMIODE.

**Capsules and Cameos**. Send us (Director@simiode.org) a paragraph or two description of a  "happening" or "event" from your class in which modeling was used to teach differential equations.

**Visit our SIMIODE Blog** for thoughtful commentary or form your own blog. Recent entries include Women abound in mathematics . . no bounds, Teachers are designers of meaningful experiences for their students (and themselves!), and Remaking Education - Long View, but Starting Now.

**Register to referee and review submitted materials.**  Good scholarship merits attention and our double-blind, peer-referee system affords quality reviews of submitted materials. Please, visit our Manuscript Management system and register as a referee.

**Post slides from your presentations or talks.**  When you give a talk you can post your slides, details of the talk or meeting, and comments at Resources: Presentations. Now that you have spread the word beyond the SIMIODE community bring it back home for your fellow SIMIODE members to see.

**Attend a MAA Contributed Paper Session at MathFest or an AMS Special Session at JMM** devoted to modeling in differential equations course work and see what others are doing. Step up after the talk and engage the speaker. You will have a new collegial friend!

Attend one of our **SIMIODE Workshops and Minicourses** at national mathematics meetings.

**When you attend a talk** on an application of differential equations encourage the presenter to consider sharing these ideas with the SIMIODE community. Encouragement helps young faculty expand their reach.

As always please let us hear from you with your concerns, your news, and your activities. Contact us at Director@SIMIODE.org.
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