

## Volume IV Number 1

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### WELCOME TO SIMIODE AND OUR NEWSLETTER

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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](http://www.simiode.org). SIMIODE is now entering its fifth year as a community and its fourth year in publishing this newsletter.

SIMIODE is a 501(c)(3) nonprofit organization, based in Cornwall, New York in the United States. Contact: [Director@SIMIODE.org](mailto:Director@SIMIODE.org).

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### SCUDEM FOR YOU AND YOUR STUDENTS

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SIMIODE is sponsoring a modeling competition specific to the pivotal STEM course, differential equations. We call it **Student Competition Using Differential Equations Modeling (SCUDEM)**. After our very successful inaugural SCUDEM on 14 October 2017 at Mount Saint Mary College, Newburgh NY USA, for schools within a two hour drive of Newburgh NY, we offer SCUDEM at sites around the country and beyond on 21 April 2018. Currently there are 99 sites in the United States and beyond. [Team registration](#) is open from 1 February 2018 - 1 April 2018.

We offer a [SCUDEM 2017 video](#) in which students and faculty share their enthusiasm for using modeling in solving real problems to learn differential equations. Student interviews are very, we mean VERY, convincing as to the value of this modeling competition in their learning and growth in applying the mathematics they are learning.

At the [SCUDEM 2017 site](#) we offer complete results including the statement of the posed problems, the additional issues offered on Competition Saturday, results with all student submissions, award information, a way cool [video](#), a [PowerPoint overview](#) of the event, [MathBowl](#) fun competition. Try it. You will enjoy it! You can find answers in the Teachers Group Resources at SIMIODE.

We announce **SCUDEM 2018**. This competition is for three member teams of students. SCUDEM takes place over a week-long period that begins with teams selecting one of three modeling problems on Friday, 13 April 2018, at each team's individual home campus, and culminates on Competition Saturday, 21 April 2018, at 9:00 AM at a nearby regional host site in the United States and beyond.

Complete site information can be found at [SCUDEM 2018 host sites](#), including a list of local sites for the competition.

Teams will work at their home institution, developing approaches and solutions to one of three posed modeling scenarios. They will prepare an Executive Summary and a 10 minute Presentation. Scenarios are designed so that every team may experience success in modeling, enhance their model building skills, and increase their confidence in modeling with differential equations.

On Competition Saturday, teams will travel with their faculty coach to a nearby host site. In the morning teams will work on a small additional issue to their modeling scenario for inclusion in their final presentation, not their Executive Summary which will be submitted at Registration. Faculty will participate in faculty development to help them use modeling in their coursework.

At morning registration, teams will turn in a final version of their Executive Summary which will be judged by coaches present. In the afternoon, each team will present their 10 minute Presentation, judged by an audience of coaches, faculty, and participating students.

After lunch there will be a MathBowl for students. The competition culminates in an awards ceremony, closing the day by 4:30 PM to allow time for travel.

There is a modest registration fee (US \$200) for team participation and faculty development

workshop for faculty coach. Additional faculty may join workshop and judging activities at no cost. Registration will close on 1 April 2018.  
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## SIMIODE IS A TAX EXEMPT ORGANIZATION

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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 2017 video](#). 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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## WHAT ARE YOU WAITING FOR? PUBLISH 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 our peer reviewed, double blind referee system.

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.

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## PUBLISHING YOUR STUDENTS' PROJECTS

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You assign projects in your differential equations courses, often encouraging students to find project areas of interest to them. You collect them and take the time to grade them and give them feedback. As you read them there are several which really stand out. They are exceptionally well-written; they involve interesting mathematics - stuff you did not realize; they extend the mathematics you offered them in your course; and they leave you with a great feeling about your students.

Encourage and enable your students to submit these excellent projects for publication in SIMIODE. You can see how to submit materials [here](#).

We have a place for publishing completed student projects so others can see the work of your best and finest. Have your students submit their project to our [Manuscript Management](#) site for refereeing, editing, and acceptance. They can also submit supplemental materials, e.g., video, spreadsheet, data sets, computer algebra files, posters, PowerPoint slides, extra pdf files.

We believe quality student work is worthy of display, of sharing, and of praise. Do this for your students. Help them publish their good work at SIMIODE.

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## CALL FOR PAPERS ON LINKING DIFFERENTIAL EQUATIONS WITH SOCIAL JUSTICE AND ENVIRONMENTAL CONCERNS

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We encourage SIMIODE members and others to consider sharing their ideas and projects in a Special 2018 Issue of the online *CODEE Journal*, on the theme of Linking Differential Equations with Social Justice and Environmental Concerns, with Dr. Samer Habre of the CODEE Editorial Board as Editor. This is a very special opportunity with a focus on exceptional applications of differential equations. The deadline for proposals is 2 April 2018 and for actual papers 1 October 2018. Please send questions and proposals to [specialissue@codee.org](mailto:specialissue@codee.org).

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## COMMENTS HELP CREATE COMMUNITY AT SIMIODE

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

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## MODELING SCENARIOS YOU MIGHT CONSIDER USING IN YOUR

We publish more and more Modeling Scenarios all the time after they have worked their way through the referee and editorial process and are made available at our growing list of [Modeling Scenarios](#). We have a Student Version in which the STATEMENT of the problem is offered with supporting materials and we have the Teacher Version in which COMMENTS are offered to assist in planning, teaching, and carrying out the modeling activity.

Kurt Bryan of Rose-Hulman Institute of Technology in Terre Haute IN authored a very nice Modeling Scenario which deals with just what you should do about your thermostat when you go away on vacation. You can find this work at [1-079-S-HomeHeating-StudentVersion](#). If you use this material be sure to add your Comments and Feedback in the Comments tab at the Teacher Version of the Resource.

All Modeling Scenarios are FREE, downloadable, and customizable under the most generous Creative Commons license. [Visit here](#) to see them all. They are fully searchable by topics and area of interest to you.

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### SIMIODE EVENTS AT MATHFEST 2018 IN DENVER CO USA - 1 - 4 AUGUST 2018

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SIMIODE is sponsoring a Minicourse : Initiating, Designing, Building, and Using Modeling Scenarios for Teaching Differential Equations, organized by Brian Winkel, SIMIODE, Cornwall NY; Eric Sullivan, Carroll College, Helena MT; Lisa Driskell, Colorado Mesa University, Grand Junction CO; and Audrey Malgon, Virginia Wesleyan University, Virginia Beach VA. Details will appear in Spring MAA FOCUS issue.

Description: This minicourse offers experienced guidance and hundreds of rich sources for initiating, designing, and building teaching materials for teaching differential equations using mathematical models from a wide variety of cognate disciplines. We offer this minicourse in support of colleagues who wish to create teaching materials for teaching differential equations through modeling. The leadership team of accomplished authors will discuss how they prepare and produce modeling scenarios and then help participants focus on projects of their own creation. We will share many sources for constructing teaching materials, point to immediate possibilities available to participants, and help them gain confidence in their ability to compose their own lessons. Through active, hands-on, small group work participating faculty will experience using modeling to teach differential equations from day one as but one example of the kind of material they can produce.

SIMIODE is also running a Contributed Paper Session: Modeling-Based Teaching and Learning in Differential Equations, organized by Brian Winkel, SIMIODE, Cornwall NY; Lisa Driskell, Colorado Mesa University, Grand Junction CO; and Audrey Malagon, Virginia Wesleyan University, Virginia Beach VA. Details will appear in Spring MAA FOCUS issue.

Description: This session features talks centered around modeling-based teaching and learning in differential equations courses. Presentations may include descriptions of modeling-based scenarios developed for these courses as well as shared experiences of using modeling in a course, from a one-time project to redesigning an entire course. We welcome speakers who are just beginning to use this method along with those with more experience. We are particularly interested in talks which feature real data (either collected or taken from the literature) and a full modeling process for students, i.e. stating assumptions, making identifications, creating a differential equation model, developing solution strategies, performing parameter estimations, rendering model validation, iterating this process, and communicating the results. Some evidence of the success of individual approaches should be offered.

To submit an abstract for MAA MathFest 2018, go to [www.maa.org/mathfest/abstracts](http://www.maa.org/mathfest/abstracts) and follow the instructions found there. The deadline for submission of abstracts is 30 April 2018. Early submissions are encouraged.

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### FREE ONLINE DIFFERENTIAL EQUATIONS TEXTS

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We offer [annotated listings of FREE online differential equations texts](#). This is one of the more popular sections when colleagues visit our site. There are over two dozen such texts. Colleagues have shared their materials in complete text form, often with traditional course structure, as well as rich sets of resources from which to teach. Most texts offered cover the basics of technique and offer exercises. Many offer modeling applications. Your students will appreciate a FREE text and you might enjoy the fresh approaches taken in such presentations. Try it!

Ideally we believe one could save student lots of money by using a FREE online text along with SIMIODE Modeling Scenarios. Make the move for your students and enjoy the excitement of using modeling to motivate learning in your differential equations course.

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### SOURCES FOR YOUR OWN MODELING SCENARIOS

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SIMIODE offers [potential modeling scenario ideas](#). There are hundreds of these! These are materials, thoughts, pointers, summaries, articles, etc. to encourage and support your modeling scenario ideas. You must be registered and signed in to view these resources. Consider these ideas and use them to design your own modeling scenarios for your students and then publish this material in SIMIODE.

Of course, you can publish your own source materials, perhaps ideas you have not been able to get to, but want to or wish to engage with others in producing a Modeling Scenario. Just upload them for all to see. Use the "Start a new Potential Scenario Idea" button and

contribute.  
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## WORDS FROM THE DIRECTOR

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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.

**Please 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.

**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](mailto:Director@SIMIODE.org).  
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