SIAM Unwrapped – August 2015

This issue of Unwrapped brought to you with partial support from:

Dear SIAM members,

It's that time of year again! SIAM will elect members to its Board and Council, as well as several officers including President-elect, Vice President at Large, and Secretary, starting in September. Be sure to vote and make your voices heard on who will make important decisions for our community.

On September 1, look for an e-mail message from the "SIAM Election Coordinator" (support@votenet.com) with your unique voting credentials and a link to the voting site.

Regards,

Karthika Swamy Cohen

Editor

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::: SIAM HQ UPDATE :::

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SIAM Prizes at ICIAM 2015

Will you be attending the 8th International Congress on Industrial and Applied Mathematics (ICIAM 2015) in Beijing next week? As is customary, SIAM will award several of its major prizes at the Prizes and Awards Luncheon to be held at the Congress. The prize luncheon will take place 12:00-1:30 p.m. on Thursday, August 13, as part of the meeting.

Three of the prize winners, Jennifer Tour Chayes, the John von Neumann Lecturer; Eitan Tadmor, recipient of the Peter Henrici Prize; and Linda J. S. Allen, winner of the AWM-SIAM Sonia Kovalevsky Lecture, will also deliver scheduled lectures during the meeting. Dates and times of the lectures are as follows:

Peter Henrici Lecture: Tuesday, August 11, 7 – 8 pm, Ballroom C
The John von Neumann Lecture: Wednesday, August 12, 7 – 8 pm, Ballroom C
Sonia Kovalevsky Lecture: Thursday, August 13, 7 – 8 pm, Ballroom C

Other awardees to be honored at the prize luncheon include Carlos Castillo-Chavez, winner of the SIAM Prize for Distinguished Service to the Profession; George Em Karniadakis, recipient of the Ralph E. Kleinman Prize; and Gerhard Wanner, recipient of the George Pólya Prize for Mathematical Exposition.

Another major SIAM prize, the W. T. and Idalia Reid Prize was awarded to Francis Clarke at the SIAM Conference on Control and Its Applications in Paris, France, last month.

Please read full details on the prize winners and their accomplishments in detailed press releases here: http://connect.siam.org/category/prizes/

Sign up for *SIAM News* alerts

Are you an avid reader of *SIAM News*? Be the first to read the latest issue when it is published online! Sign up to receive alerts as new issues are posted.

Visit sinews.siam.org, and click on the “sign up” button on the top right to get on the list.

::: PUBLIC AWARENESS :::

Moody's Mega Math Challenge goes national

The high school math modeling contest organized by SIAM with funding from The Moody's Foundation is reaching a milestone. After celebrating its 10th anniversary at the 2015 Challenge, in 2016 the contest goes national, being offered in the U.S., its territories and DODEA schools worldwide. Starting as a local contest in the New York City metropolitan area in 2006, the Challenge has come a long way. In its maiden year, the competition awarded 11 prizes totaling $60,000 in scholarships; the Challenge will award 90 prizes for a total of $150,000 to winning teams next year.

View a retrospective video that captures the evolution of the Challenge. Also visit the Challenge retrospective page to view flashback videos with Champion teams from previous years to find out where they are now and what doing math modeling in high school meant to them:

http://m3challenge.siam.org/ten-years-of-m3-challenge

What is on SIAM's YouTube channel?

Have you visited SIAM's YouTube Channel? SIAM produces interesting video clips from conference sessions and interviews, generating, on average, a video or two per month on intriguing applications and topics. One fun clip features 32 applications in 60 seconds. No, that is not a typo. See it here: https://youtu.be/CISZeQC8QxA

You can also subscribe to the channel through your Google account to be notified every time a new video is posted.

Math matters in many different ways

While we're on the subject of cool mathematical applications, don't forget SIAM's *Math Matters, Apply It!* flyers, which touch upon various daily uses of math.

Personalized medicine and big data are all the rage right now. Combine those two together and you get healthcare data analytics. Big data and data mining tools have brought about unprecedented advances in disease diagnosis. Statistical analysis based on demographics, risk factors, individual health parameters, and genetic information can help clinicians identify patients with predisposition toward certain diseases. Data mining models applied to patient datasets and genomic data can yield information that can greatly enhance prediction of patient needs. This is just one of many applications illustrated in SIAM's over 40 Math Matters flyers. View them all!

http://www.siam.org/careers/matters.php

::: PUBLISHING NEWS & NOTES :::

Do you have undergraduate student research worthy of publishing?

Do you have, or know of, noteworthy research conducted by an undergraduate? You may want to consider publishing your results in SIAM Undergraduate Research Online (SIURO), a web-based publication that accepts papers to which undergraduates have made significant contributions. Representing a wide range of topics that span discrete mathematics and dynamical systems to modeling and computation, SIURO publishes the most outstanding research presented by students in the field. To find out more, view previous volumes, or sign up for e-alerts when a paper is posted, go to:

http://www.siam.org/students/siuro/index.php

New SIAM Books

Finite Dimensional Linear Systems

Roger W. Brockett

Originally published in 1970, Finite Dimensional Linear Systems is a classic textbook that provides a solid foundation for learning about dynamical systems and encourages students to develop a reliable intuition for problem solving. The theory of linear systems has been the bedrock of control theory for 50 years and has served as the springboard for many significant developments, all the while remaining impervious to change. Since linearity lies at the heart of much of the mathematical analysis used in applications, a firm grounding in its central ideas is essential.

This book touches upon many of the standard topics in applied mathematics; develops the theory of linear systems in a systematic way, making as much use as possible of vector ideas; and contains a number of nontrivial examples and many exercises.

Additional information: http://bookstore.siam.org/cl74

2015 / xvi + 244 pages / Softcover / ISBN 978-1-611973-87-7 / List Price $74.00 / SIAM Member Price $51.80 / Order Code CL74

The Shapes of Things: A Practical Guide to Differential Geometry and the Shape Derivative

Shawn W. Walker

Many things around us have properties that depend on their shape—for example, the drag characteristics of a rigid body in a flow. This self-contained overview of differential geometry explains how to differentiate a function (in the calculus sense) with respect to a “shape variable.” This approach, which is useful for understanding mathematical models containing geometric partial differential

equations (PDEs), allows readers to obtain formulas for geometric quantities (such as curvature) that are clearer than those usually offered in differential geometry texts.

Readers will learn how to compute sensitivities with respect to geometry by developing basic calculus tools on surfaces and combining them with the calculus of variations. Several applications that utilize shape derivatives and many illustrations that help build intuition are included.

Additional information: http://bookstore.siam.org/dc28

2015 / xii + 206 pages / Softcover / ISBN 978-1-611973-95-2 / List Price $74.00 / SIAM Member Price $51.80 / Order Code DC28

Spline Functions: Computational Methods

Larry L. Schumaker

This book describes in detail the key algorithms needed for computing with spline functions and illustrates their use in solving several basic problems in numerical analysis, including function approximation, numerical quadrature, data fitting, and the numerical solution of PDEs. The focus is on computational methods for bivariate splines on triangulations in the plane and on the sphere, although both univariate and tensor-product splines are also discussed.

Additional information: http://bookstore.siam.org/ot142

2015 / xii + 412 pages / Hardcover / ISBN 978-1-611973-89-1 / List Price $83.00 / SIAM Member Price $58.10 / Order Code OT142

::: UPDATES ON CONFERENCES & PRIZES :::

2016 Gene Golub SIAM Summer School

Have you heard good things from students who have participated in prior Gene Golub SIAM Summer Schools? There have been six so far on a variety of topics, and the location for the seventh, the 2016 G2S3, has just been announced. It will take place at Drexel University in Philadelphia, Pennsylvania from July 25 – August 5 next year. The topic for 2016 is Stochastic Differential Equations and Wave Propagation. In addition, the summer school will precede the 2016 SIAM Conference on Nonlinear Waves and Coherent Structures, also being held in Philadelphia, from August 8 – 11.

The deadline for applications is February 1, 2016. More information about the summer school and a flyer announcing the 2016 G2S3 can be found at http://www.siam.org/students/g2s3/index.php. A link to the application site will be posted in the fall. Applicants selected to participate pay no registration. Funding for local accommodations and meal expenses will be available for all participants. Limited travel funds are also available.

SIAM conference registrations & submissions

SIAM Conference on Geometric and Physical Modeling (GDSPM15), October 12-14, 2015, Salt Lake City, Utah, USA
Pre-registration deadline: Monday, September 14, 2015
https://www.siam.org/meetings/gdspm15/regform.php

Algorithm Engineering and Experiments (ALENEX16) , January 10, 2016, Arlington, Virginia, USA
Extended abstract submission deadline: September 1, 2015, 11:59 PM EDT
http://www.siam.org/meetings/alenex16/submissions.php

Analytic Algorithmics and Combinatorics (ANALCO16), January 11, 2016, Arlington, Virginia, USA
Extended Abstract Submission Deadline: August 15, 2015, 11:00 PM EDT
http://www.siam.org/meetings/analco16/submissions.php

SIAM Conference on Uncertainty Quantification (UQ16), April 5-8, 2016, Lausanne, Switzerland
Deadline for minisymposia proposals: September 7, 2015
Deadline for contributed lecture, poster and minisymposium presentation abstracts: October 5, 2015
http://www.siam.org/meetings/uq16/submissions.php

SIAM Conference on Parallel Processing for Scientific Computing (PP16), April 12-15, 2016, Paris, France
Deadline for minisymposia proposals: September 15, 2015
Deadline for contributed lecture, poster and minisymposium presentation abstracts: October 13, 2015
http://www.siam.org/meetings/pp16/submissions.php

SIAM International Conference on Data Mining (SDM16), May 5-7, 2016, Miami, Florida, USA
Deadline for paper abstract submission, workshop proposals, and tutorial proposals: October 9, 2015
Deadline for paper submission: October 16, 2015
http://www.siam.org/meetings/sdm16/submissions.php

SIAM Conference on Imaging Science (IS16), May 23-26, 2016, Albuquerque, New Mexico, USA
Deadline for minisymposia proposals: October 26, 2015
Deadline for contributed lecture, poster and minisymposium presentation abstracts: November 23, 2015
http://www.siam.org/meetings/is16/submissions.php

Prize nomination deadlines

The deadline for nominations for the following prizes is September 15, 2015:
SIAG/IS Early Career Prize
SIAG/IS Best Paper Prize

SIAG/DM Dénes König Prize

The deadline for nominations for the following prizes is October 15, 2015:

Richard C. DiPrima Prize

George Pólya Prize in Combinatorics

W. T. and Idalia Reid Prize

For the complete list of the call for nominations, please visit:
http://www.siam.org/prizes/nominations.php

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