MSCS ⚕ MESS

Next Monday's Colloquium

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Title:	SwingJS – Resurrecting the interactive functionality of Java on the web as JavaScript
Speaker:	Bob Hanson
Time:	3:30 PM
Date:	April 15
Place:	RNS 310

About the talk: For over 15 years, from 1995 until 2012, Java applets reigned supreme on the web as *the* way to easily create and deliver dynamic, full-featured interactive web-based components that, for the first time, were essentially totally operating-system and browser independent. But in January of 2013, the US Department of Homeland Security ended all that with a recommendation that Java in browsers be removed or disabled. Five years later, in 2018, the Java browser plug-in has been pulled out of all mainstream browsers.

The demise of the Java applet took with it innumerable otherwise excellent web sites, particularly in the STEM education fields. In this presentation I will discuss challenges and recent successes we have had in a project that started here at St. Olaf in the fall of 2012, first in relation to the Jmol Molecular Visualization Project, and more recently expanded to allow virtually all Java applets to be integrated into web pages again – but not as Java this time, rather *JavaScript*. As a bonus, even full-fledged Java applications can be embedded in web pages for the first time. The re-entry of "Java" to the web offers the possibility of resurrecting important web sites that have gone dark in the intervening years as well as developing new ones that go well beyond typical Java or JavaScript functionality.

The two-fold challenge of (a) concurrently *co-compiling* Java source code into both standard Java "byte code" as well as JavaScript and (b) creating a Java run-time environment executable in pure JavaScript has been daunting. Nonetheless, over the past three years we have created a stable compiler and a nearly full-featured run-time library. We have produced or assisted in the production of well over 500 applets ranging from mathematics to physics, chemistry, and bioinformatics. These successes set the stage for a new era of hybrid Java/JavaScript programming that offers unprecedented possibilities for web development, transcending the usual distinction between "web-based" and "stand-alone" programming.

Next Friday's Research Seminar

Title:	Fluid Flows with Tiny Tubes
Speaker:	Will Mitchell '06
Time:	3:40 PM
Date:	April 19
Place:	RNS 204
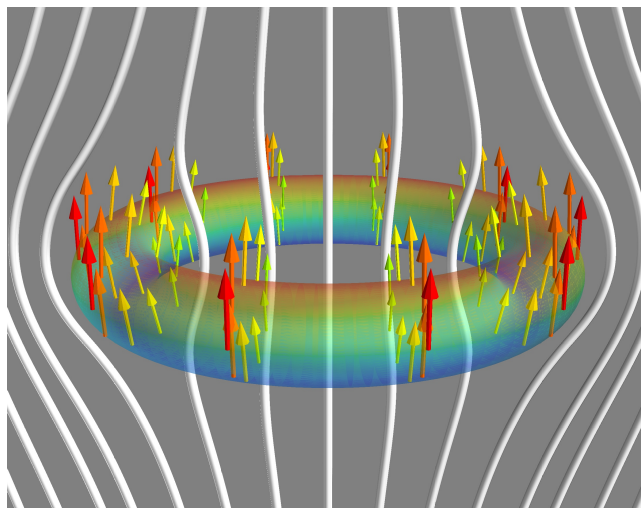
About the Talk: The mechanical properties of thin fibers immersed in a viscous fluid are important in biological and industrial settings such as paper manufacturing, gel electrophoresis, and flagellar swimming. To simulate the fluid mechanical part of this problem, one turns to the Stokes system of partial differential equations. In this talk I will review the calculus of curves and tubes, motivate the use of integral equations as mathematical models, and finally show some recent numerical results on fluid flow around closed tubes.

About the Speaker: Will Mitchell studies viscous fluid mechanics. He earned a B.A. at St. Olaf College and spent several years teaching mathematics at the junior high level, first in Burkina Faso with the U.S. Peace Corps and later at the International School of Minnesota. Will then completed master's and doctoral programs at the University of Alaska-Fairbanks and the University of Wisconsin-Madison, respectively, and now teaches at Macalester College.

Honors Day 2019

Interested in learning seen what research Oles have been doing on campus and elsewhere? Come to Honors Day on Friday, May 3 from 4:00-5:30 PM. Those interested in presenting should register by Tuesday, April 16 here. All are welcome to attend, and we encourage you to invite your friends and family. An ample quantity of sweet and savory hors d'oeuvres will be provided.

Computer Scientist in the News

Dr. Katie Bouman has been in the news lately for leading a team of researchers to create an algorithm that produced the first photo of a black hole! Because the black hole M87 is so distant, Dr. Bouman and her team had to develop algorithms to process data from a network of eight telescopes on four different continents to produce the image. For more information on black holes and the efforts to image them, check out this article.
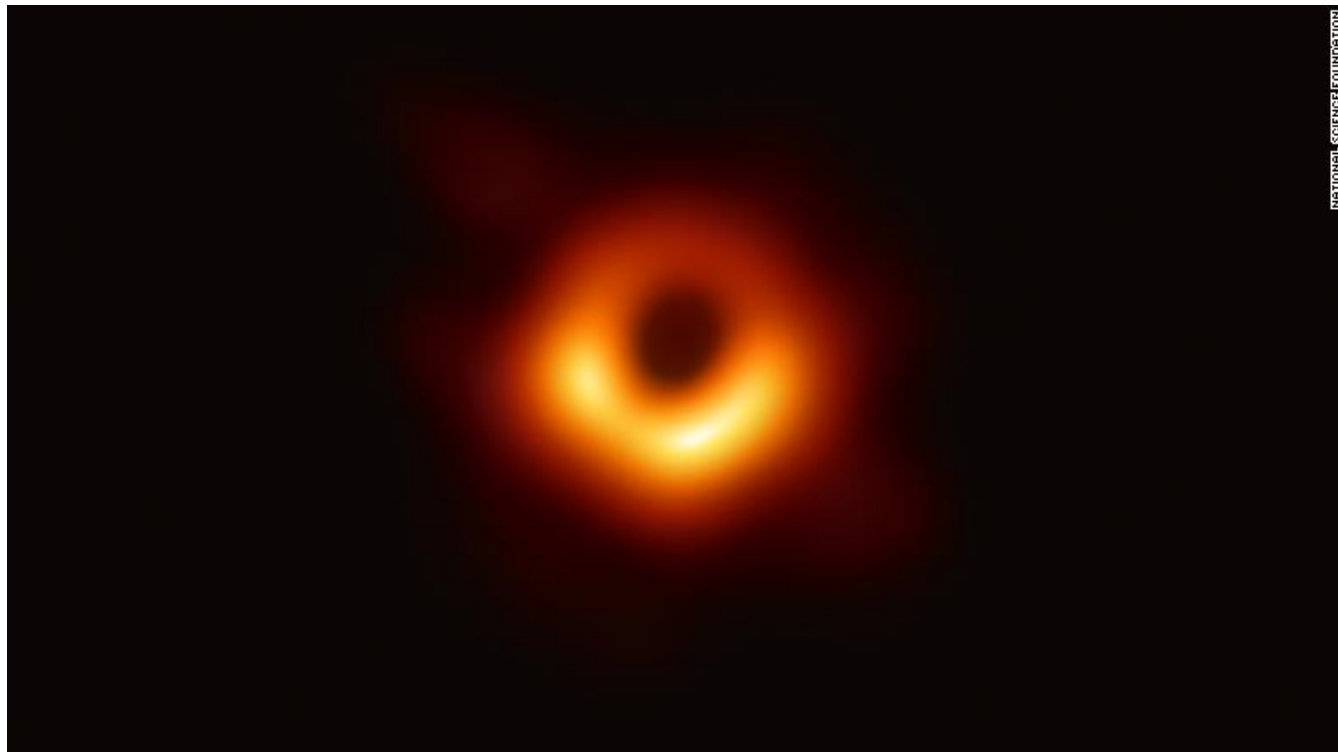
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