



CCT Weekly August 28- September 3, 2011

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LSU Assistant Professor Shawn Walker Addresses Free Boundary Problems

A recently funded project will explore the math behind the movement of fluids and other objects with complex moving boundaries. Results of the research will improve the control and design of industrial processes.

Shawn Walker, assistant professor of the LSU Department of Mathematics and the Center for Computation & Technology (CCT), was awarded a grant from the National Science Foundation for the project "Numerical Methods for Free Boundary Problems: Two-Phase Flows and Contact Line Dynamics." The award is \$90,657 over the course of three years.

Free boundary problems, such as modeling fish movements in water or how sprayed paint droplets land on a surface, arise in many areas of mathematics, physics, and engineering.

The project will bring together cutting-edge modeling, analysis tools, and computational free boundary techniques in key application areas to expand and investigate the mathematical framework that models these time-dependent, domain-deforming problems.

The research will enable better design, optimization, and control of electrowetting-assisted flow of liquid droplets, droplet-impacting processes, and films coating solids.

"The project will make these processes more efficient and productive," Walker said. "It will also create new methods for automatic grid generation of complex shapes that efficiently capture moving boundaries. Grid generation is an expensive task in terms of man-hours and money."

"One result of the research will be an automatic meshing tool that will be made available on my Web site," Walker said. "Also, I'm teaching a fall 2011 course on shape optimization with partial differential equation (PDE)-constraints to give graduate students expertise in optimization with continuum models."

The project's broader impact arises from its connection to many types of physical and industrial processes that involve moving boundaries. Examples include industrial coating flows that apply a protective layer to a surface; fluid flows in micro-fluidic devices driven by electric fields, which is important in biomedicine; motion of rigid bodies in a fluid, such as particulate flows; dynamics of lipid bio-membranes, which has applications in biology; and the peeling of adhesive tape from a rigid support.

For more information on this or other research being done at the LSU Center for Computation & Technology, visit <http://www.cct.lsu.edu/home>. Walker's web site is www.math.lsu.edu/~walker/.

Lectures this week:

Tuesday –

There will be a Computational Mathematics Seminar Series lecture on "A Diffuse Interface Model For Electrowetting" by Abner Salgado, University of Maryland. The lecture will take place Tuesday, August 30 at 3:30 PM in 338 Johnston Hall.

CCT welcomes:

Zi Yang Meng, post doctoral researcher, joined Mark Jarrell's LA-SIGMA research project on August 29th.

CCT in the news:

Business Briefs for Aug. 21, 2011: LSU postdoc fellow receives award

Source: [The Advocate](#)

Company News

Source: [Businessreport.com](#)

Please Note:

- The University will be closed on Monday, September 5th in observance of Labor Day.
- Post Your Part-time Jobs for FREE through Careers2Geaux:**

Now that school is back in session, our students looking for part-time jobs. Through Careers2Geaux, you may post any position type, including your part-time opportunities, for FREE! This system is password-protected and available to LSU students, faculty, staff, and registered alumni 24 hours a day, seven days a week. To list your position(s) in Careers2Geaux, click the Careers2Geaux link <https://lsu-csm.symplcity.com/employers> and follow the instructions for creating an account. Once you enter the information for your position, the status of your posting will remain "pending" until reviewed by a staff member. Open positions are posted for 45 days. If you have any questions, please contact Amy Caillouet, Administrative Coordinator, at 225-578-2162 or email at amyc@lsu.edu.

- The CCT ParalleX group is proud to announce the first formal release of HPX 3 (V0.6). HPX (High Performance ParalleX) is a modular, feature-complete, and performance oriented representation of the ParalleX execution model targeted at conventional architectures and, currently, Linux based systems, such as SMP nodes and conventional clusters. The most important design objective of HPX is to create a state-of-the-art parallel runtime system providing a solid foundation for UHPC-scalable applications while remaining as efficient, as portable, and as modular as possible. Download link: <https://svn.cct.lsu.edu/repos/projects/paralleX/tags/hpx0.6.0>. If you would like to access the code, please contact Hartmut Kaiser (hkaiser@cct.lsu.edu)

- The 2011 HPC User Satisfaction Survey is open for comment until August 31st. Anyone who uses high performance computing resources at LSU or LONI is invited to take a few minutes to complete the survey: http://www.hpc.lsu.edu/survey/public/survey.php?name=hpc_at_lsu_user_2011. Please help us understand your needs and future requirements.

- Submissions for the 2012 Red Stick International Animation Festival are now being accepted. Visit <http://www.redstickfestival.org/competition/submissions/> for details.

- Save the date! Louisiana EPSCoR is hosting the greatly anticipated National Science Foundation workshop, Science: Becoming the Messenger, on November 17, 2011, at the Baton Rouge Marriott. The 1-day workshop provides targeted communications training to Researchers, Faculty & Postdocs, Students, Public Relations Officers and Communicators. The NSF's Office of Legislative and Public Affairs has assembled a team of nationally renowned communicators to provide this training. Participants will learn how to craft a message and communicate with a variety of audiences, explore new media, pick up live camera interview skills and more. There is no registration fee to attend but pre-registration is required. Registration details to come soon!
- Prior approval is required for Special Meal Requests. Employees who make meal purchases without prior approvals may find that they must cover the cost of any monies spent for an unapproved event out of pocket. Dine-in restaurant meals are not allowed on LaCarte credit cards. Please contact Susie McGlone (susie@cct.lsu.edu) prior to any special meal with visitor(s) to file the appropriate request for approval. Prior approval could take up to two weeks, so please plan accordingly.
- Please remember to send your news concerning grants, awards, conferences, or other pertinent information to CCT Event Coordinator Jennifer Fontenot at jennifer@cct.lsu.edu.
- Follow CCT with social media to access photos and see news, events or updated information. These pages are public; you do not need an account to view the information.
 - o [Facebook group](#) : LSU Center for Computation & Technology
 - o [Twitter](#) : LSUCCT
 - o [YouTube channel](#) : LSUCCT

Upcoming events:

- **September 7:** [Training: Intro to HPC, Account Allocation/Mgmt](#)
- **September 14:** [Training: Job Management w/ PBS/Loadleveler](#)

Upcoming Grant Deadlines:

Note: Please check the [CCT deadline Web site](#), since it is updated daily.

[Computer and Network Systems \(CNS\): Core Programs](#)

September 15, 2011 10:00 am
At Most \$ 3,000,000.00 available

[Information and Intelligent Systems \(IIS\): Core Programs](#)

September 15, 2011 10:00 am
At Most \$ 3,000,000.00 available

[Computing and Communication Foundations \(CCF\): Core Programs](#)

September 15, 2011 10:00 am
At Most \$ 3,000,000.00 available

[Partnerships for International Research and Education \(PIRE\)](#)

October 19, 2011 10:00 am
At Most \$ 4,000,000.00 available

[Sustainability Research Networks Competition \(SRN\)](#)

December 1, 2011 10:00 am
At Most \$ 12,000,000.00 available

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