The University of California High-Performance AstroComputing Center

UC HIPACC

Presents...

SDSC

The Future of AstroComputing

December 16 & 17, 2010

San Diego Supercomputer Center
San Diego, CA

hipacc.ucsc.edu/FOA2010.html

The goal of this conference is to clarify the big issues for the next ~5 years in astrophysical computation and data, and to bring leaders in the field and at the main funding agencies and industrial organizations to meet with key computational astrophysicists, especially from the University of California and its affiliated DOE laboratories (LANL, LBNL, LLNL) and other West Coast institutions including Stanford, Caltech, and the University of Washington.

Principal organizers: Mike Norman (SDSC), Joel Primack (UCSC), Alex Szalay(JHU)

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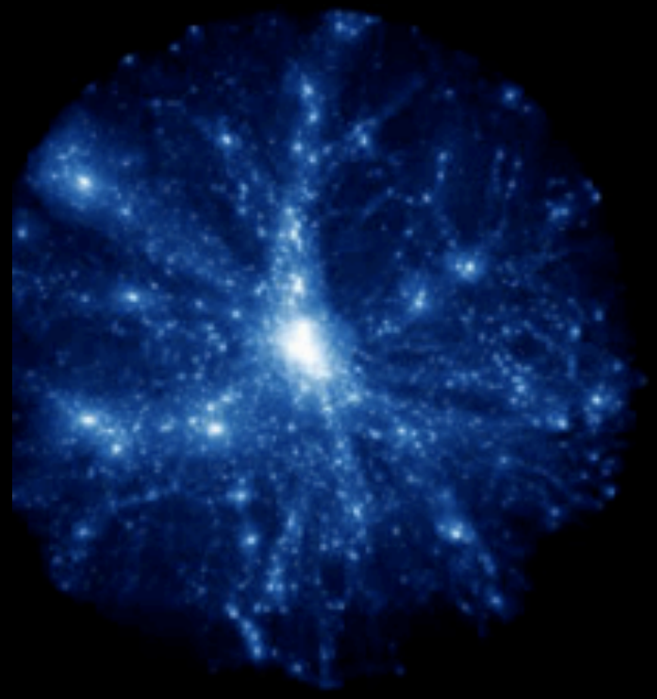
JOEL PRIMACK

UCSC



Monday, June 28, 2010

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The University of California High-Performance AstroComputing Center

A consortium of nine UC campuses and three DOE laboratories

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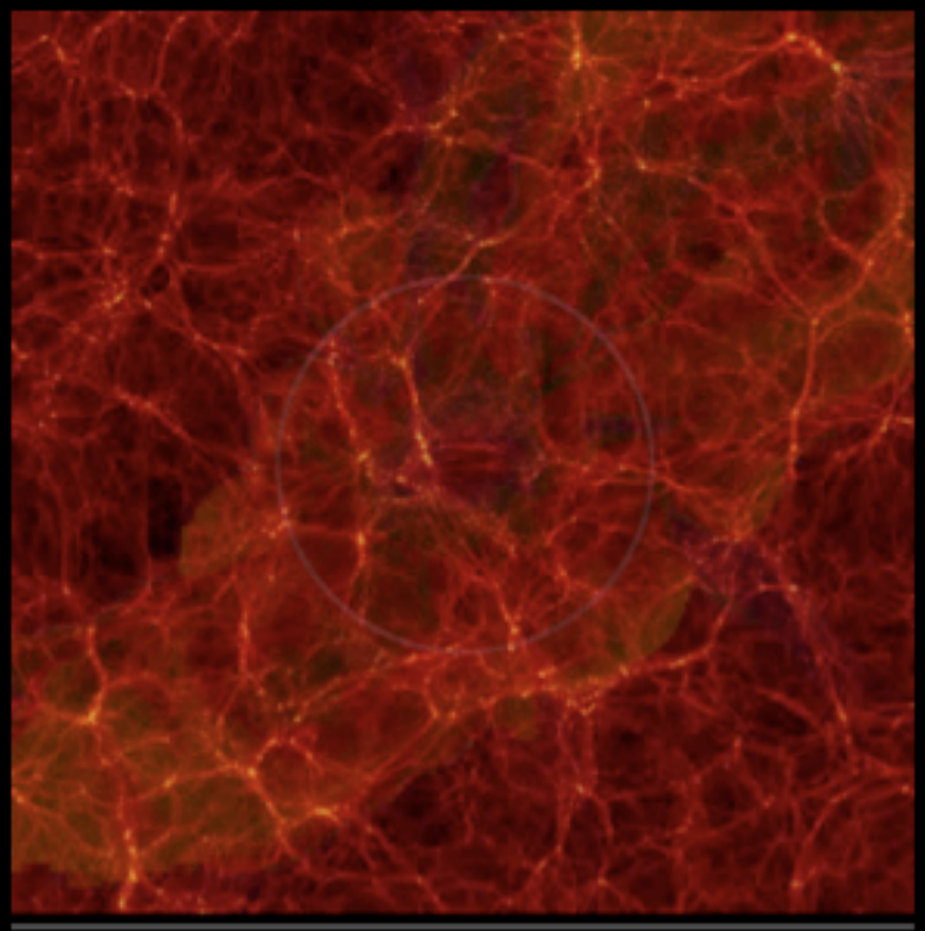
HIPACC community

Website maintained by
Nina McCurdy
nina@hipacc.ucsc.edu



Z=0 snapshot from 8G particle"Bolshoi Simulation" made with the Adaptive Refinement Tree (ART) code.

Refinement (AMR), grid-based hybrid code

Collaborators: A.Kravtsov (U.Chicago), A.Klypin (NMSU), J. Primack (UCSC), and S.Gottlöber (AIP,Germany)

News/Announcements

Welcome to the new UC High-Performance AstroComputing Center (HIPACC) website!

The application period for the 2010 International AstroComputing summer school is now closed. For more information about the school, click here.

place the cursor over the image to pause the slideshow

http://hipacc.ucsc.edu/

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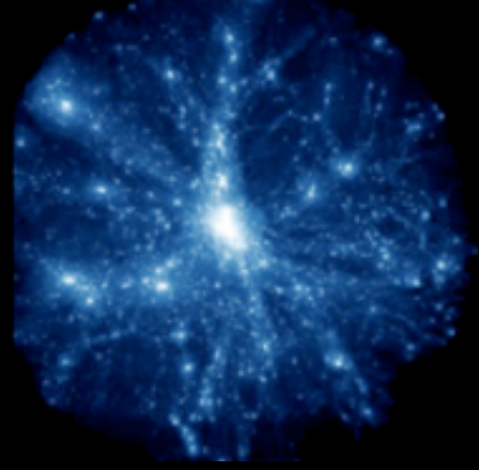
As computing and observational power continue to increase rapidly, the most difficult problems in astrophysics are now coming within reach of simulations based on solid physics, including the formation and evolution of stars and supermassive black holes, and their interactions with their galactic environments.

The purpose of HIPACC is to realize the full potential of the University of California's worldleading computational astrophysicists, including those at the affiliated national laboratories. HIPACC will do this by fostering their interaction with each other and with the rapidly increasing observational data, and by empowering them to utilize efficiently the new supercomputers with hundreds of thousands of processors both to understand astrophysical processes through simulation and to analyze the petabytes and soon exabytes of data that will flow from the new telescopes and supercomputers. This multidisciplinary effort links theoretical and observational astrophysicists, physicists, earth and planetary scientists, applied mathematicians, and computer scientists on all nine UC academic campuses and three national labs, and exploits California's leadership in computers and related fields.

HIPACC's outreach activities will include developing educational materials, publicity, and websites, and distribution of simulation outputs including visualizations that are beautiful as well as educational.



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UC-HIPACC Leadership

Executive Committee
Director: Joel Primack (UCSC) <joel@ucsc.edu>
Coordinator from Northern California: Peter Nugent (LBNL)
Coordinator from Southern California: Michael Norman (UCSD)

Council

UC Berkeley: Christopher McKee
UC Davis: TBA
UC Irvine: James Bullock
UC Los Angeles: Steve Furlanetto
UC Merced: TBA
UC Riverside: Gillian Wilson
UC San Diego: Michael Norman
UC Santa Barbara: S. Peng Oh
UC Santa Cruz: Sandra Faber
Los Alamos National Lab: Salman Habib
Lawrence Berkeley National Lab: Peter Nugent
Lawrence Livermore National Lab: Peter Anninos

UC-HIPACC Staff

UC-HIPACC Office Manager: Esperanza Zamora <zamora@ucsc.edu>
Visualization and Outreach Specialist: Nina McCurdy <nmccurdy@ucsc.edu>
Publicity and Proposal Writing: TBA

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Annual Conferences in Northern and Southern California

HIPACC will sponsor two large meetings each year especially (but not exclusively) for scientists working on computational astrophysics and related topics at the UC campuses and labs. Unlike the more specialized meetings of working groups, we expect that these larger meetings will be broad, with the purpose of bringing theoretical astrophysicists together with computer science specialists, computer hardware experts, and observational astronomers. One meeting will be in northern California and the other in southern California to promote maximum participation. In addition to sharing new information, these meetings will highlight problems needing attention to advance the state-of-the-art and introduce participants to potential colleagues and begin collaborations.

Annual International AstroComputing Summer Schools

HIPACC will support an annual school aimed at graduate students and postdocs who are currently working in, or actively interested in doing research in, AstroComputing. Topics and locations of the annual school will rotate, and Caltech and Stanford are also welcome to participate.

The 2010 school was at UCSC, on the topic of Hydrodynamic Galaxy Simulations. Lectures were presented by experts on the leading codes (AMR codes ART, Enzo, and RAMSES, and SPH codes Arepo, GADGET, and Gasoline) and the Sunrise code for making realistic visualizations including stellar SED evolution and dust reprocessing. There were 60 students, including 20 from outside the USA. Lecture slides and videos, codes, inputs and outputs are on the UC-HIPACC website http://hipacc.ucsc.edu. Funding from NSF helped to support non-UC participant expenses.

The 2011 school will be July 11-23 at UC Berkeley/LBNL/NERSC, on the topic of Computational Explosive Astrophysics: novae, SNe, GRB, and binary mergers. The scientific organizers are Daniel Kasen (LBNL/UCB) and Peter Nugent (LBNL). Additional information is in your packet.

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Funding Opportunities

Calls for proposals scheduled twice annually for Fall/Winter & Spring/Summer funding Cycles.

UC-HIPACC will support focused working groups of UC scientists from multiple campuses to pursue joint projects in computational astrophysics and related areas by providing funds for travel and lodging. At the heart of UC-HIPACC are working groups. These groups will typically consist of collaborations of two to a dozen people, in practice mostly graduate students and post-doctoral fellows, from two or more UC campuses or DOE labs. Periods will typically range from a few days to a few months.

1. Small travel grants enable scientists, graduate students, and post-doctoral students to travel easily and spontaneously between Center nodes. UC-HIPACC will fund travel grant proposals submitted by faculty members, senior scientists, postdocs or graduate students up to $1000 on a first-come-first-served basis with a simple application describing the plan and purpose of the travel.

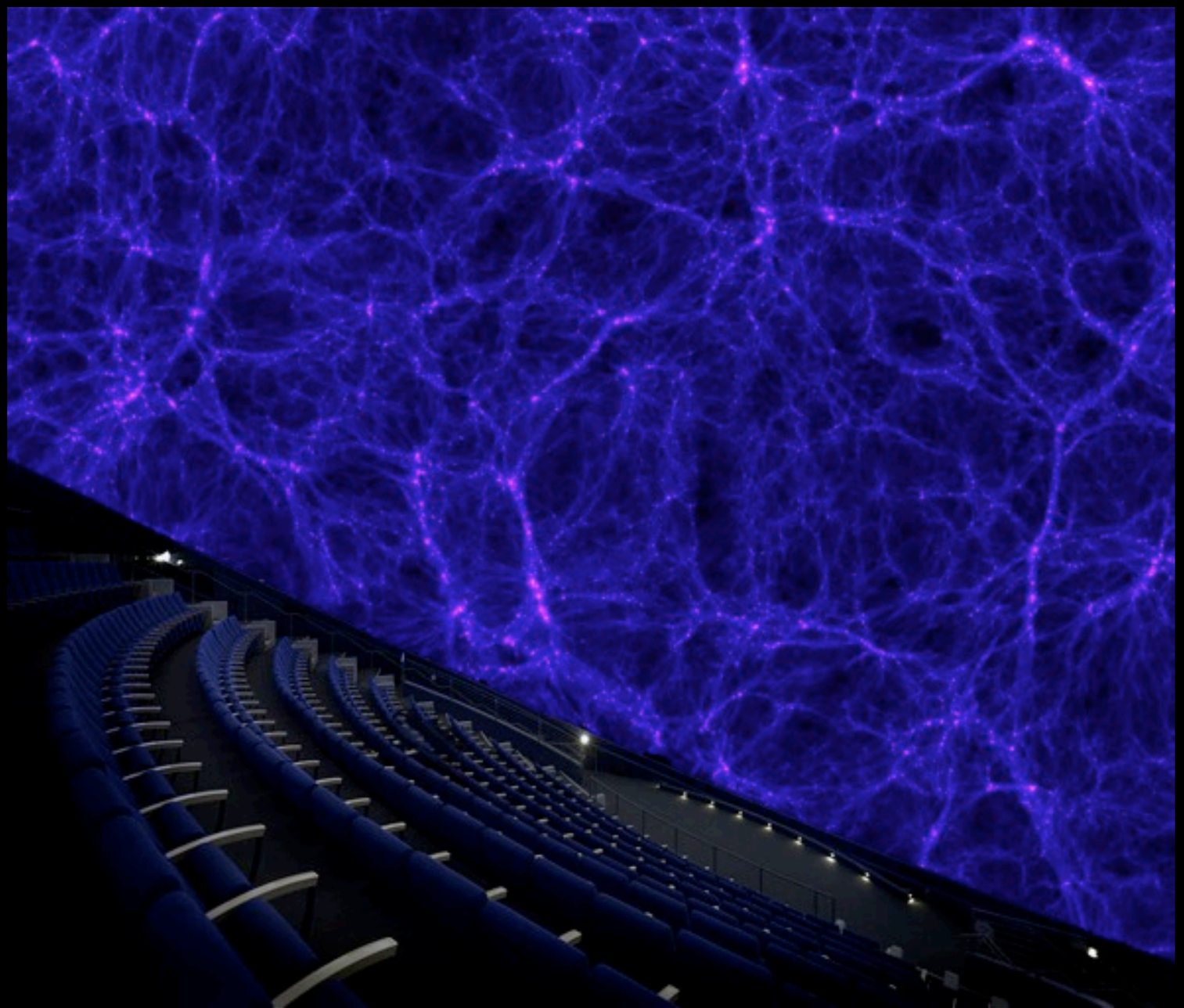
2. Grants ranging between $1000 - $5,000 to support larger working groups or participation in scientific meetings.

3. Mini Conference grants of up to $5,000 to support collaborations of multiple UC campuses and DOE labs.

4. Innovative initiative proposals for other purposes that are consistent with the goals of UC-HIPACC. Such purposes could include meetings or workshops, software development, or education and outreach.

Astro-Computation Visualization and Outreach

Project lead: Prof. Joel Primack, Director, UC High-Performance AstroComputing Center
UC-HIPACC Visualization and Outreach Specialist: Nina McCurdy



HIPACC is working with the Morrison Planetarium at the California Academy of Sciences (pictured here) to show how dark matter shapes the universe. We are helping prepare their planetarium show opening fall 2010, and also working on a major planetarium show to premiere at the Adler Planetarium in spring 2011.

Galaxy Merger Simulation

Run on Columbia Supercomputer at NASA Ames Research Center.
Dust simulated using the Sunrise code (Patrik Jonsson, UCSC/Harvard).

Astronomical **observations** represent snapshots of particular moments in time; it is effectively the role of astrophysical simulations to produce movies that link these snapshots together into a coherent physical theory.

Showing Galaxy Merger simulations in 3D will provide a deeper, more complete picture to the **public** and scientists alike.

If you want a copy, ask
zamora@ucsc.edu

TRT 01:31:19
Aired: 9:00 PM on October 24th, 2010

NATIONAL GEOGRAPHIC CHANNEL

INSIDE THE MILKY WAY

Including interviews with Astronomers Tom Abel, James Bullock,
Richard Ellis, Alex Filippenko, Andrea Ghez, Robert Kirshner,
Avi Loeb, Geoff Marcy, Joel Primack, and Seth Shostak

Director/Producer: Duncan Copp, DOX Productions Ltd.

DVD VIDEO

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Welcome to the Conference!

Thanks for your attention!

Any questions?