

Five Year Report: Center for Applied Mathematics, 2004 - 2009

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Funded/proposed research project grants in area of focus.

The Center for Applied Mathematics is a University of Florida type III center. It is thus solely funded by a portion of the grant overhead generated by Mathematics Department faculty who are thus members in the center. During the reporting period there were 21 members of the Center whose returned overhead came from 38 grants for a total of \$34,949. A list of these grants is included at the end of this report. There is no FTE-funded support to CAM, and CAM does not apply directly for external funding.

Funding conference travel for students.

Each semester CAM sends out an announcement calling for proposals for travel support by graduate students to conference. Travel to conferences exposes students to the state of the art in their chosen field and gives them the opportunity to present their work and thereby gain exposure and recognition. At conferences students also begin to develop the networks which will be essential to their future employment and professional success. In a typical year CAM supports 5 students traveling to conferences at a rate of around \$500 each. CAM considers student travel support to be a high return, efficient use of the Center's resources. During the reporting period CAM supported 22 graduate student conference trips for a total of \$10,203.

Funding prospective graduate student visits.

In accord with a portion of its mission statement, CAM supports the continuing quality and development of the graduate program in applied and applicable mathematics. The members of CAM frequently have external funding which includes graduate student support and so high quality graduate students are essential for the successful completion of member's funded projects. CAM financial contribution to graduate student recruitment takes the form of paying for a campus visits by promising graduate students after they have been offered admission, but before they have made their decision on where to attend. During the reporting period CAM supported 5 campus visits by prospective graduate students for a total of \$690.

Funding conference travel for faculty.

Each semester CAM sends out an announcement calling for proposals for travel support for department faculty to conferences. Conference presentations and participation are an essential part of a faculty member's professional activities, and as with student conference travel, CAM considers faculty travel support to be a high return, efficient use of the Center's resources. In a typical year CAM supports 7 faculty traveling to conferences at a rate of around \$500 each. During the reporting people CAM supported 34 faculty conference trips for a total of \$13,131.

Promoting and funding seminars with C/I funds.

CAM supports the annual CAM Colloquium as well as research visitors to the UF who generally give a seminar and/or colloquium talk. The speakers in the CAM Colloquium in the past five years were:

- 2008-9, Bertram Kostant (MIT)
- 2007-8, Srinivasa Varadhan (Courant Institute, NYU)
- 2005-6, Peter Lax (Courant Institute, NYU)
- 2004-5, Carl Pomerance (Dartmouth College)

Expenditures in this category for the reporting period were \$5,286.

Promoting and funding major conferences in area of focus.

Conferences are large scale, expensive endeavours. CAM has decided to spend its limited budget on a larger number of smaller, high impact awards as indicated above. However, CAM does occasionally provide modest support to supplement external funding for conferences. In the reporting period these conferences were the Chat Ho Memorial Conference, The SIAM Gator Student Conference of 2008, and the Ulam Centennial for a total expenditure of \$1,600.

Computational Infrastructure.

While mathematics, in general, does not require a large physical infrastructure, high quality computing facilities suitable for moderate scale computations are essential for faculty research as well as for attracting and retaining high quality graduate students. When possible within its limited budget, CAM tries to assist in maintaining high quality computing facilities within the Mathematics Department.

During the reporting period, total expenditures in this category were \$2,381. As this report is being written we are finalizing plans for CAM to purchase \$10K hardware for a major upgrade of the Graduate Student Mathematical Computation Lab including 3 high performance stations for larger scale computations.

Funded research project grants which supported CAM.

Note that this list does not contain 6 older grants which are not contained in the PeopleSoft system.

- Alladi, Krishnaswami, *Some Problems in the Theory of Partitions*, NSA, 12/28/2006 - 12/27/2008.
- Bona, Miklos, *Lines vs cycles*, NSA, 01/01/2005 - 01/20/2007.
- Bona, Miklos, *Research of polynomials having combinatorial origins*, NSA, 01/15/2003 - 01/14/2005.
- Bona, Miklos (co-PI) (Meera Sitharam, CISE, PI), *Macromolecular Assembly*, NSF, 09/2007 - 08/2010.
- Boyland, Philip, *Collaborative Research: Topological Fluid Mechanics*, NSF, 09/15/2006 - 08/31/2010.
- Censer, Douglas, *Collaborative Research: Algorithmic Randomness*, NSF, 05/01/2007 - 06/30/2009.

- Chen, Yunmei, *Biochemical markers of traumatic brain injury*, NIH, 4/1/2006 - 3/30/2011.
- Chen, Yunmei, *Segmentation of ultrasound images*, NIH, 07/01/06 - 06/30/10.
- Chen, Yunmei, *Mathematical and Computational Algorithms for Visualization of Human Brain Neural Pathways*, NSF, 10/1/2005 - 9/30/2007.
- Chen, Yunmei, *Deformable registration in radiotherapy*, ViewRay Inc, 3/1/06 - 8/15/07.
- Crew, Richard, *Local Study of p-adic Differential Equations*, NSA, 03/07/2006 - 03/06/2008.
- De Leenheer, Patrick, *Models In Mathematical Biology*, NSF, 08/15/2004 - 07/31/2006.
- De Leenheer, Patrick, *Models in Mathematical Biology: A Feedback Perspective II*, NSF, 08/2006 - 07/2009.
- Gopalakrishnan, Jay, *Improving mixed methods by hybridization and multigrids*, NSF, 06/01/2004 - 08/31/2008.
- Gopalakrishnan, Jay, *Frontiers of finite element methods*, NSF, 07/2007 - 06/2010.
- Jury, Michael, *Topics in Composition Operators*, NSF, 04/2007 - 05/2010.
- Mair, Bernard, *Gated Cardiac ECT Reconstruction with Motion Analysis*, NIH, 07/01/2004 - 06/30/2008.
- Martcheva, Maia, *Effects of host age-structure*, NSF, 11/01/2003 - 08/24/2006.
- Mccullough Scott, *Topics in dilation theory*, NSF, 05/01/2002 - 08/18/2006.
- Mccullough Scott, *Topics in Dilation Theory*, NSF, 05/15/2005 - 04/30/2008.
- Mccullough Scott, *Dilation Theory, Non-commutative Convexity and Systems*, NSF, 05/15/2008 - 04/30/2011.
- Moskow, Shari, *Asymptotics at Resonant Scales: Application to Inhomogeneous Material Simulation, Discretization and Inversion*, NSF, 08/2006 - 07/2007.
- Pilyugin, Sergei, *Adaptive Dynamics of Microbial Populations*, NSF, 08/01/2005 - 07/31/2009.
- Shabanov, Sergei, *Propagation of Narrow Electromagnetic Beams*, Science Applications Intl Corp (USAF), 05/09/2005 - 09/01/2005.
- Tiep, Pham, *Research in group theory and applications*, NSA, 02/19/2004 - 08/18/2006.
- Tiep, Pham, *Representations of Finite Groups and Applications*, NSF, 06/01/2006 - 05/31/2009.
- Turull, Alexandre, *Research in finite group theory*, NSA, 01/22/2003 - 01/21/2006.
- Turull, Alexandre, *Research in Finite Group Theory*, NSA, 05/15/2006 - 05/13/2009.
- Voelklein, Helmut, *Covers of the sphere and moduli of curves*, NSF, 07/01/2002 - 07/31/2005.

- Zapletal, Jundrich, *Cardinal invariants and descriptive set theory*, NSF, 07/2003 - 07/2008.
- Zapletal, Jundrich, *Forcing Idealized*, NSF, 04/01/2008 - 03/31/2011.
- Zhang, Lei *Blowup analysis for two dimensional elliptic equations with exponential nonlinearities*, NSF, 06/2006 - 01/2008.