

## **Report on ICIAM Conference Support for Applied and Industrial Mathematics in Developing Countries**

**Proposer:** José Alberto Cuminato  
**Conference:** National Conference on Computational and Applied Mathematics  
**Sponsor:** Brazilian Computational and Applied mathematics Society (SBMAC).  
**Place:** Cuiabá – Brazil  
**Period:** 08 – 11 September 2009  
**Amount:** US \$3,500.00

**Introduction** – As stated in the proposal submitted to ICIAM this grant purported to fund the participation of prize-winners students in the Brazilian Conference in Computational and Applied Mathematics – SBMAC annual meeting. We expected to fund the participation of 6 students: Two best students in each category, Undergraduate work (IC), Master Dissertation and Ph. D. Thesis. Unfortunately due to the high costs of the air travel we managed to fund only the first prize winners in each category, and we then decided to award a cash prize to the winners with the remaining funds.

### **The Selection Process**

For each category the students submitted their work together with recommendation letters from their supervisor and from at least one of the examining members of the committee of their work. Selection committees were nominated for each category, as follows:

### **Ph. D. Thesis:**

**Number of applicants: 12**

**Coordinator - Haroldo F. de Campos Velho - LAC/INPE**

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#### **Members:**

Frederic Valentin (LNCC) - [valentin@lncc.br](mailto:valentin@lncc.br)

Liliane Basso Barichello (UFRGS) - [lbaric@mat.ufrgs.br](mailto:lbaric@mat.ufrgs.br)

Saulo Barros (USP) - [saulo@ime.usp.br](mailto:saulo@ime.usp.br)

### **M. Sc Dissertation:**

**Number of applicants: 19**

**Coordinator - João Batista Carvalho**

Instituto de Matematica - UFRGS

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#### **Members:**

Álvaro Bortoli (UFRGS), Dagoberto Justo (UFRGS) , Fabricio Tourrucoo (UFRGS), Leandro Farina (UFRGS), Leonardo Guidi (UFRGS) , Maria Cristina Varriale (UFRGS), Rosemaira Coppeti (UFSM), Rudnei Cunha (UFRGS), Vilmar Trevisan (UFRGS), Waldir Leite Roque (UFRGS)

### **Undergraduate Work (IC)**

**Number of applicants: 12**

**Coordinator - Luiz Satoru Ochi**

Instituto de Computação - Universidade Federal Fluminense

e-mail: [satoru@ic.uff.br](mailto:satoru@ic.uff.br) or [luiz.satoru@gmail.com](mailto:luiz.satoru@gmail.com)

#### **Members:**

Aurelio Ribeiro Leite de Oliveira (IMECC-UNICAMP) - [aurelio@ime.unicamp.br](mailto:aurelio@ime.unicamp.br)

Loana Tito Nogueira (IC-UFF) - [loana@ic.uff.br](mailto:loana@ic.uff.br)

Maria Amélia Biagio (UnB) - [mamelia@unb.br](mailto:mamelia@unb.br)

We believe that, due to the cash prizes we awarded this year for the first time, we had an increase in the number of applicants for the M. Sc. and Ph. D. award. It is quite remarkable that 12 students applied for the Doctoral prize as this must be almost the total of Ph. D. degrees awarded in Brazil in Computational Mathematics in the year to June, 30<sup>th</sup> 2009.

## Prize winners

### Ph. D. Thesis

Student: **Clarice Dias de Albuquerque** (FEEC-Unicamp)

Thesis Title: Analysis and construction of topological quantum codes on two-dimensional varieties.

Supervisors: Reginaldo Palazzo Júnior (FEEC-Unicamp) e Eduardo Brandani da Silva (DMA/UEM)

Course: Engenharia Elétrica - Universidade Estadual de Campinas (Unicamp)

Main Publications:

1) **ALBUQUERQUE, C. D.** ou de Albuquerque, C. D. ; PALAZZO JR., R. ; SILVA, E. B. . Topological quantum codes on compact surfaces with genus  $g \geq 2$ . Journal of Mathematical Physics, v. 50, p. 023513, 2009.

2) **ALBUQUERQUE, C. D.** ou de Albuquerque, C. D. ; PALAZZO JR., R. ; SILVA, E. B. . On toric quantum codes. International Journal of Pure and Applied Mathematics, v. 50, p. 221-226, 2009.

### M. Sc. Dissertation

Student: **Rafael Alves Bonfim de Queiroz** (ICMC-USP-São Carlos)

Dissertation Title: Development and tests of high resolution upwind schemes and applications to free surface incompressible flows.

Supervisor: Valdemir Garcia Ferreira (ICMC-USP-São Carlos)

Course: Ciências da Computação e Matemática Computacional - Universidade de São Paulo (USP-São Carlos)

Main Publications:

1) FERREIRA, V. G. ; KUROKAWA, F. A. ; **QUEIROZ, R.A.B.** ; KAIBARA, M. K. ; Oishi, C. M ; Cuminato, J. A. ; A. Castelo ; TOME, M. F. ; Mckee, S. . An Assessment of a High-Order Finite Difference Upwind Scheme for the Simulation of Convection-Diffusion Problems. International Journal for Numerical Methods in Fluids (Print), v. 60, p. 1-26, 2009.

2) **QUEIROZ, R.A.B.** ; FERREIRA, V. G. ; Cuenca, R. G. . A new high resolution TVD scheme for unsteady flows with shock waves. TEMA. Tendências em Matemática Aplicada e Computacional, v. 9, p. 311/2-320, 2008.

### Undergraduate Work

Student: **Antonio Carlos de Andrade Campello Júnior** (IMECC-Unicamp)

Work Title: Conexões entre códigos corretores de erros e reticulados.

Supervisor: Sueli Irene Rodrigues Costa (IMECC-Unicamp)

Course: Matemática Aplicada - Universidade Estadual de Campinas (Unicamp)

### Acknowledgments

Thanks to ICIAM support we were able to achieve a substantial increase in the interest for the SBMAC prizes, increasing the number of students that applied for the prizes. As a result the quality

of the work of the prize winners was much higher this year, as can be accessed from their publication list.

## Money Balance:

Funds Received from ICIAM via SIAM/Banco do Brasil

Total received on 02/jun/2009 USD 2500 equivalent to R\$ 4806,24 in Brazilian Real (R\$)

Exchange rate : **1US\$=R\$1.9225.**

Expenses incurred by the students:

Student/Expenses	<b>Clarice Dias de Albuquerque – Ph. D. Prize</b>	<b>Rafael A. Bonfim de Queiroz – M. Sc. Prize</b>	<b>Antonio A. Campello</b>	<b>Total Spent</b>
Travel Expenses	R\$570/US\$297	R\$1058/US\$550	R\$1012/US\$526	
Hotel/Living Expenses	R\$633/US\$330	R\$259/US\$135	R\$633/US\$330	
Plaques/diplomas				R\$710/US\$370
Cash Prize	R\$1000/US\$520	R\$700/US\$364	R\$500/US\$260	
<b>Total</b>	<b>R\$2203/US\$1145</b>	<b>R\$2017/US\$1049</b>	<b>R\$2145/US\$1115</b>	<b>R\$7075/US\$3680</b>

São Carlos, October 20<sup>th</sup>, 2009

**José Alberto Cuminato**  
Responsible for the grant