

REPORT OF THE BRAZILIAN SECTION OF THE COMBUSTION INSTITUTE - 2014/2015

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The Brazilian Section of the Combustion Institute has its actions linked to the activities of the Brazilian Combustion Network, a network with 310 active members at the end of 2015 involving faculty, researchers and graduate students working in combustion in 37 universities and institutes in Brazil.

The RNC has functioned since 2008 through the financial support from the Brazilian Minister of Science and Technology and National Counsel of Technological and Scientific Development, CNPq.. During 2014-2015, the RNC/Brazilian Section had its efforts focused on:

1. Forming and continually educating human resources in the combustion area in Brazil, especially, working providing opportunities for graduate students.
2. Fostering the nucleation of collaborative projects among its members and external partners. This included:
 - 2.1. Approximation with partners from the remaining countries in South America through an action with international office of the Brazilian Minister of Science, Technology and Innovation (MCTI) and the Union of the South American Countries (UNASUL),
 - 2.2. Approximation with partners from industry using the industry organizations in Brazil, such as the National Confederation of Industry (CNI).
3. Guarantee the wide exposure and discussion of its decisions and results, such as, presentations, course material, lectures, opportunities, etc..

The RNC/Brazilian Section is steering by a Scientific Committee formed by seven members elected biannually, by direct vote of the members present in the general assembly held during the Combustion Schools. The Scientific Committee elects its president. The roles of the Scientific Committee, as expressed in the By-Laws, are planning, inducing, deciding and executing the actions of the network and the relation with external partners. The committee reports to the general assembly of its members and to the sponsoring agencies. The committee members are:

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Manoel Nogueira President	UFPA	manoelfmnogueira2@gmail.com
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Activities over the past 2 years in which the section has been involved.

Action 1: The Fifth Brazilian Combustion School (V EdC)

Date: June 24-28, 2015

Venue: Bourbon Ibirapuera Convention Hotel, São Paulo, Brazil

Format: 2 short courses (16h), 8 lectures, poster session and round table.

Attendance: 121 Brazilian and 32 foreigners participants totaling 153 persons. From this, 56 participants received financial support from the combustion school.

Organizers: University of São Paulo (USP) – Polytechnic School under coordination of Guenther Carlos Krieger Filho.

Short description: Following the tradition of the previous Brazilian Combustion Schools (2007-Florianópolis, 2009-São José dos Campos, 2011-Salvador, 2013-Belém) this school had a format based on 2 short courses, lectures, a permanent poster section and a getaway trip.

- Course 1: **Turbulent Combustion Modeling.** Guenther Carlos Krieger Filho, UsP (Reactive flow basics and RANS Models); Savio Viana, UNICAMP (LES Models); Flavio Galeazzo, UsP (Combustion of sprays); Amsini sadiki, Darmstadt (LES Applications); Carlos Salinas, UNICAMP (Radiation in participating media); Rogerio GONçalves, UNICAMP (Radiation in turbulent flames); Luis Fernando Figueira da Silva, PUC-Rio (PDF Methods).
- Course 2: **Advanced Diagnostic Techniques for Combustion Processes.** Nicolau A. S. Rodrigues, IEAv (Principles of laser measurements); Antonio L. Pacifico, UsP (Laser velocimetry (PDI, LDA)); Maria Esther Shampato and Alberto Monteiro dos Santos, IEAv (Absorption and emission spectroscopy); Newton Fukumasu, UsP (PIV); Andreas Dreizler, Darmstadt (Advanced thermometry); Felipe Daniel Tauk Santos, Embraer (LII); Leila R. dos Santos, ITA (LIF 2); Jurandir Itiro Yanagihara, UsP (Uncertainty analysis);

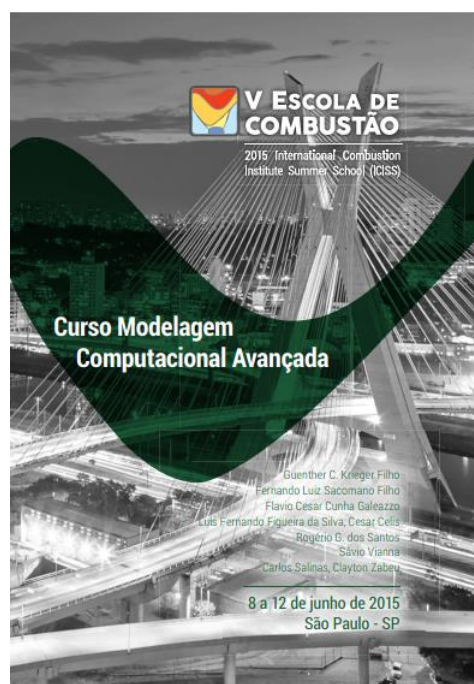
Lectures:

1. Katharina Kohse-Höinghaus – Univ. Bielefeld – Germany; (Opening Lecture);
2. Pavlos Aleiferis – Univ. College London – UK; Mixture Formation and Combustion in Direct-Injection Spark-Ignition Engines with Alcohol Fuels;
3. Andreas Dreizler – Technical University of Darmstadt – Germany; Advances in Optical Methods for Combustion;
4. Amsini Sadiki - Technical University of Darmstadt – Germany; Turbulence Models for Gaseous and Spray Combustion;
5. Guillaume Ribert – Coria/CNRS – France; Real-gas effects on fluid injection: numerical and experimental study;
6. Juan Rolon Gadea – Univ. Nacional de Assuncion – Paraguay; Challenges for Combustion Research Networking in Latin America;
7. Ricardo Pereira – GE-Brasil; Recent developments in combustion systems for industrial applications;
8. Rafael Licen dos Santos – AVL-South America; Advanced Measurement Techniques for Internal Combustion Diagnostics

All printed material and presentations created for the school are freely available for download from the internet (www.redenacionaldecombustao.org).

Final cost: 82,644 USD

Sponsors: National Brazilian Combustion Network-RNC (from a grant from the Brazilian Minister of Science and Technology), CNPq, CAPES, FAPESP, AEB, USP, Combustion Institute and Private companies.



Above, the attendee to the 5th Combustion School and, lower the books prepares specially as a teaching material to the courses.

Action 2: Approximation with partners in other South America Countries

During 2014-2015, several meetings occurred with officials from the Brazilian MCTI and UNASUL intending the organization of a South American program on Energy-Combustion. This program would involve exchange of human resources among the participating institutions and fostering the development of collaborative projects. The 52 universities/institutions involved in this action are:

From Brazil: INPE – Instituto de Pesquisas Espaciais, IPT – Instituto de Pesquisa Tecnológica, ITA – Instituto Tecnológico da Aeronáutica, Inmetro – Instituto Nacional de Metrologia, Normalização e Qualidade; CIENTEC – Fundação de Ciência e Tecnologia, da Secretaria de Ciência e Tecnologia do Rio Grande do Sul; UFBA – Universidade Federal da Bahia, UFMG - Universidade Federal de Minas Gerais, UFPA – Universidade Federal do Para, UFPR – Universidade Federal do Paraná, UFRGS – Universidade Federal do Rio Grande do Sul, UFSC – Universidade Federal de Santa Catarina, UFU – Universidade Federal de Uberlândia; UnB – Universidade de Brasília; Unicamp – Universidade de Campinas; USP – Universidade de São Paulo, Unifei – Universidade Federal de Itajubá; UFMG, - Universidade Federal de Minas Gerais; UFGD – Universidade Federal da Grande Dourados, Mato Grosso do Sul, UTFPR - Universidade Técnica Federal do Paraná, Unifor – Universidade de Fortaleza, PUC-Rio – Pontifícia Universidade Católica do Rio de Janeiro; Unisinos – Universidade do Vale do Rio dos Sinos, URI - Universidade Regional Integrada do Alto Uruguai e das Missões;

From Peru: Universidad Nacional Agraria La Molina (UNALM), Universidad Nacional de Ingenieria (UNI), Universidad Nacional Mayor de San Marcos (UNMSM), Pontificia Universidad Catolica de Peru (PUCP), Universidad Catolica San Pablo (UCSP), Universidad Nacional San Agustin (UNSA), Universidad de Piura (UdP); **From Chile:** Universidad Tecnologica Frederico Santa Maria (USM), Universidad de Chile (UdC), **From Uruguay:** Universidad de la Republica (UR); **From Colômbia:** Universidad Nacional de Colombia - Medellin(UNC), Universidad Tecnologica de Pereira (UTP), Universidad Industrial de Santander (UIS), Universidad Francisco de Paula Santander, Universidad de Pamplona, Universidad Pontificia Bolivariana, Universidad Tecnologica de Pereira, Universidad de Ibagué (UI), Universidad del Valle (UDV), Universidad Nacional de Colombia, Universidad de los Andes (ULA); Universidad de Antioquia (UA), Universidad del Norte (UDN), Cenicafé – Centro Nacional de Investigaciones de Café , Cenicaña – Centro Nacional de Investigaciones de la Caña, Instituto Colombiano do Petróleo (ICP – Ecopetrol), Centro de Desarrollo Tecnológico de Gas (CDT de Gás).

Meeting happened during 2014 and 2015

- November 2014, at Brasilia involving representatives of Colombia, Suriname, Paraguay, Uruguay, Chile, Equator, Venezuela, Bolivia and Brazil to discuss action to be implemented on training of human resources on combustion with focus on industrial process.

Action 3: Approximating the section to partners in Industry

A call for proposals / opportunities was developed with the Brazilian CNI. From two preparation meetings involving representatives from RNC and from the major energy-consuming industries in Brazil held at CNI, a format was decided. This call involved (1) collecting opportunities for research and development from Industry, (2) relaying these opportunities to the Section members, (3) collecting the answers, (4) organizing the interested groups and (5) setting the specific meetings involving the interested prospective partners, academia+industry. From this moment on, the scientific committee assumed a simple observation role, by collecting periodically reports on the development of the specific actions. Two actions are under development and we expect to report them in the future.

Action 5: Fostering participation of young researchers in the CI supported initiatives

Participation of Brazilian section member in the 35th International Symposium on Combustion at California, USA. The section promote the brazilian submission (07 papers) and one was accepted..

Action 6: Maintenance of the Home-Page

This is a continuing action. The homepage <http://redenacionaldecombustao.org> is used as a permanent repository of information and bibliographic material created in the actions supported by the Brazilian Section. This homepage is supported by the section.