The Abdus Salam
International Centre for Theoretical Physics

United Nations Educational, Scientific and Cultural Organization

IAEA International Atomic Energy Agency

Minischool and Workshop on
Multiple Time Scales in the Dynamics of the Nervous System

16 - 20 June 2008

Miramare - Trieste, Italy

The Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, is organizing a ***Minischool and Workshop on Multiple Time Scales in the Dynamics of the Nervous System, to take place from 16 to 20 June 2008.***

The event will focus on the present understanding of the role of multiple time scales in the dynamics of the nervous system. Intrinsic time scales of single neuron dynamics are mostly in the range of a few to a few hundreds of milliseconds. Between such time scales and the very long ones underlying long-lasting metabolic or even functional anatomic changes, time spans ranging from seconds to months are observed to be involved in cognitive processes, and call for a theoretical framework to account for their emergence and role. In many cases it is attractive, if not compelling, to think of such a variety of time scales as the manifestation of a rich repertoire of collective dynamic states in large assemblies of neurons and synapses. Emergence of up and down states, sustained neural activity supporting working memory, collective global oscillations on wide frequency ranges, bursting, ramping activity tuned to task-relevant timing are examples of behaviours still not easily incorporated in a unified theoretical frame. Furthermore, irregularities in the time course of the relevant dynamic quantities are pervasively observed, from the inter-spike intervals of recorded neurons, to the distribution of reaction times observed in psychophysics. The role of noise as a putative constituent element of brain dynamics has just begun to be investigated. The time dimension (and noise) is also a challenging aspect of modeling synaptic changes, as models have to encompass phenomena ranging from short-term facilitation and depression, to Long-Term Potentiation and Depression, to Long- Term memory; learning achieved in one-shot to very slow learning; the effects of neuromodulation on learning.

The two-days Minischool will provide an up-to-date and broad overview of experimental and theoretical approaches, while the three-days Workshop will present more technical and specialized contributions of frontier research.

The Workshop program will also include a small number of contributed talks and two poster sessions. ***We encourage applicants willing to present an oral or poster contribution to submit a one-page abstract before 16 March 2008 for evaluation***.

The meeting will be dedicated to the memory of Prof. Daniel Amit, whose seminal, creative and vigorous activity in the field has inspired and provoked so many of us in the last 20 years.

PARTICIPATION

Scientists and students from all countries that are members of the United Nations, UNESCO or IAEA may attend the activity. As it will be conducted in English, participants should have an adequate working knowledge of this language. Although the main purpose of the Centre is to help researchers from developing countries through a programme of training activities within a framework of international cooperation, a limited number of students and post-doctoral scientists from developed countries are also welcome to attend.

As a rule, travel and subsistence expenses of the participants are borne by their home institutions. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants, who are nationals of, and working in, a developing country, and who are not more than 45 years old. Such support is available only to those attending the entire activity. There is no registration fee.

Requests for participation

There is no registration fee for attending the activity. The "Request for Participation" form is obtainable via Web server: ***http://agenda.ictp.it/smr.php?1947*** It should be completed, signed and returned by using only one of the following ways before 16 March 2008, if asking for financial support and before **30 APRIL 2008, if not requiring visa nor financial support**:

If sending an application by e-mail to mailto:smr1947@ictp.it please save and send file attachments in either PDF (preferably) or RTF zipped or Doc format.

If sending an application form by regular mail or courier it should be posted to:

Minischool and Workshop on the Nervous System
(smr 1947 c/o Ms. de Comelli)
the Abdus Salam International Centre for Theoretical Physics
Strada Costiera 11, 34014 Trieste, Italy

(Recent photograph & signature of the candidate are compulsory)

ACTIVITY SECRETARIAT: ***Telephone: +39-040-2240305*** ***Telefax: +39-040-224163***
E-mail: mailto:smr1947@ictp.it ***ICTP Home Page: http://www.ictp.it***

Trieste, April 2008

Co-sponsored by:

INFN

INFN - Italian National Institute for Nuclear Physics

DIRECTORS

Nicolas BRUNEL
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(Columbia, New York and Neuroinformatics ETH UNI, Zurich)

Riccardo ZECCHINA
(Politecnico di Torino and Microsoft Research, Redmond)

INVITED SPEAKERS

ABBOTT, Larry (Columbia)
AMIT, Yali (Chicago)
BIALEK, William (Princeton) *
CHELAZZI, Leonardo (Verona) *
DURSTEWITZ, Daniel (Plymouth)
MONGILLO, Gianluigi (Paris)
RAINER, Gregor (Tubingen)
SALZMAN, Daniel (Columbia)
SANCHEZ VIVES, Maria (Barcelona)
SOMPOLINSKY, Haim (Jerusalem)
TREVES, Alessandro (SISSA)
WANG, Samuel (Princeton)
WANG, Xiao-Jing (Yale)
WOLF, Fred (Göttingen) *
ZOHARY, Ehud (Jerusalem)
*to be confirmed

NEW DEADLINE DATES
for requesting participation:

16 March 2008, if requesting financial support

30 APRIL 2008, if not requiring visa nor financial support