



University of Cyprus  
Center for Applied  
Neuroscience



# 4<sup>th</sup> Scientific Conference of the Center for Applied Neuroscience

**SEPTEMBER 29, 2014  
9:00 A.M.– 3:00 P.M.  
BUILDING 07, HALL 010**

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# PROGRAM

8:30-9:00	<b>Registration</b>
<i>Welcome Address</i>	
9:00-9:20	<i>Prof. Constantinos Christophides</i> , Rector, University of Cyprus <i>Prof. Fofi Constantinidou</i> , Professor of Psychology, University of Cyprus and Director, CAN
<i>Keynote Speakers</i>	
9:20-10:15	<i>Prof. Andrew C. Papanicolaou</i> , Professor and Chief in the Department of Pediatrics of Department of Anatomy and Neurobiology at the University of Tennessee. <b>Functional Neuroimaging: The first thirty years</b>
10:15-11:10	<i>Dr. Jason D. Robinson</i> , Assistant Professor in the Department of Behavioral Science at the University of Texas MD Anderson Cancer Center, and a member of its Tobacco Research and Treatment Program. <b>Evaluating Motivational Salience across the Smoking Spectrum</b>
11:10- 11:40	<b>Coffee Break &amp; Networking</b>
11:40-12:10	<i>Dr. Eleftherios Papathanasiou</i> , Clinical Neurophysiologist, Cyprus Institute of Neurology and Genetics. <b>Vestibular Evoked Myogenic Potentials (VEMPs)</b>
12:10-12:40	<i>Dr. Costas Pitris</i> , Associate Professor, Department of Electrical and Computer Engineering, University of Cyprus. <b>Optical Coherence Tomography (OCT) for in vivo microstructural and functional imaging</b>
12:40-13:10	<i>Ms. Elina Demetriadou</i> , Health Psychologist, Department of Intensive Care Medicine, Nicosia General Hospital <b>BIG data in Neuro-Intensive Care: Combining the CREATIVE clinical database for severe Traumatic Brain Injury with Biomedical signals, follow up indices and genetic data</b>
13:10-13:40	<i>Prof. Andreas Demetriou</i> , Professor of Psychology and President of the University of Nicosia Research Foundation and an Honorary Professor of Durham University, UK. <b>Reconconceptualization cycles in the mind and the brain: A comprehensive theory</b>
13:40-14:00	Final thoughts and Wrap-Up
14:00-15:00	<b>Scientific Poster session &amp; Reception</b>

*Prof. Andrew C. Papanicolaou*

## Functional Neuroimaging: The first thirty years

### Abstract:

The main accomplishments of functional neuroimaging consist in the mapping of the cortical regions containing part of the circuitry necessary for somatosensory, motor and language functions and in assessing hemispheric dominance for both language and the encoding operations of memory. At present, it is used clinically in conjunction with the classical methods of brain mapping all of which are invasive. In this presentation the case for the replacement of the invasive pre-surgical brain mapping methods, namely the method of direct cortical stimulation and the "Wada" procedure will be made and the basic research accomplishments of functional Magnetic Resonance Imaging (fMRI), Magnetoencephalography (MEG) Diffusion Tensor Imaging (DTI) and Transcranial Magnetic Stimulation (TMS) will be described.

**Professor Andrew C. Papanicolaou** received his doctorate in Psychology in 1978 and he then taught for two years at Xavier University and in the Department of Psychiatry of the University of Cincinnati. From 1980 to 2011 he was with the University of Texas Medical School, where he directed the Center for Clinical Neurosciences holding professorships in the Departments of Pediatrics, Neurosurgery and Neurology and adjunct appointments in the Department of Linguistics of Rice University and the Department of Psychology of the University of Houston. In January 2012 he joined the Department of Pediatrics and the Department of Anatomy and Neurobiology of the University of Tennessee College of Medicine as Chief of the Division of Clinical Neurosciences and Co-Director of the Neuroscience Institute of LeBonheur Hospital of Memphis. He is conducting research in epilepsy, developmental disorders, brain plasticity and in imaging of the brain mechanisms of cognitive and affective functions. He is the author of numerous scientific articles and several books ranging from technical manuals and clinical textbooks to theoretical monographs both in English and in Greek.

*Dr. Jason D. Robinson*

## Evaluating Motivational Salience across the Smoking Spectrum

### **Abstract:**

The chronic use of nicotine alters central nervous system functioning and results in the increased salience of smoking-related cues, which kindles the appetitive motivational state known as craving and drives drug seeking. Additionally, smokers often report that nicotine enhances positive affect and reduces negative affect. A potential mechanism for this mood modulation is that nicotine alters affective information processing in a manner that enhances the salience of pleasant stimuli while reducing the salience of unpleasant stimuli. Dr. Jason Robinson will present event-related potential (ERP) data that examines differences in the motivational salience of cigarette-related and affective cues among former, current, and never smokers. He will also present ERP data on how nicotine exposure and nicotine expectancy effects impact the attentional biases of smokers to smoking-related and affective cues during a vigilance task.

**Dr. Jason D. Robinson** is an Assistant Professor in the Department of Behavioral Science at the University of Texas MD Anderson Cancer Center, and a member of its Tobacco Research and Treatment Program. His research interests include identifying the neurobiological mechanisms underlying nicotine dependence and withdrawal and translating this knowledge to assist those wishing to quit smoking, particularly those resistant to treatment and prone to relapse, such as the chronically depressed. He is a clinical psychologist with extensive experience as a psychophysiological, and is proficient in the use of electroencephalography (EEG), event-related potentials (ERP), cardiography, skin conductance, and electromyography (EMG) methods to study affective and attentional processes among the drug dependent.

## Vestibular Evoked Myogenic Potentials (VEMPs)

### **Abstract:**

Vestibular evoked myogenic potentials (VEMPs) is a relatively new method of recording function (and dysfunction) from the vestibular nervous system, but is quickly gaining wide acceptance on a global scale. Air-conducted sound can be used to stimulate the saccule of the inner ear, and this is thought to be possible due to the close proximity of this vestibular end organ to the stapes footplate. Use of this short duration and reproducible stimulus allows one to record high amplitude responses from either the sternocleidomastoid muscle (cervical VEMPs or cVEMPs) or from the inferior oblique muscle (ocular VEMPs or oVEMPs). The former is related to inferior vestibular nerve function and its pathway, whilst the latter relates to the superior vestibular nerve. Bone conducted vibration can also be used to stimulate the otolith organs, and this method has also been found to be highly reproducible. Clinical applications include the confirmation of Superior Semicircular Canal Dehiscence Syndrome, as well as differentiating Vestibular Migraine from Meniere's Disease, and also indicating the presence of conditions that specifically involve either the superior and/or inferior vestibular nerve in the presence of normal caloric responses.

**Dr. Eleftherios Papathanasiou**, has been working in the field of Clinical Neurophysiology for 22 years, and is now in the Clinical Neurophysiology Laboratory of Clinic B at the Cyprus Institute of Neurology & Genetics, Nicosia, Cyprus. He is also President of the Cyprus Clinical Neurophysiology Society, and is chairman of an International Working Group for the Clinical Applications of cervical vestibular evoked myogenic potential. He has given teaching courses at meetings of the European Academy of Neurology, the World Federation of Neurology, the European Commission for Treatment and Research in Multiple Sclerosis and the Brainstem Society. He is also a member of the Editorial Board of the journal Clinical Neurophysiology.

**Abstract:**

Microstructural and functional imaging can be a powerful tool for investigating normal and disease biological tissues and processes as well as evaluating the capacity of potential therapies and monitoring the response to interventions. Microscopy, including confocal and multi-photon microscopy, has been the standard for high resolution imaging in live cells and tissues. However, these microscopy techniques suffer from relatively shallow imaging depths. Whole body fluorescence, MRI and PET allow imaging deep within the body but are hindered by low resolution and/or costly hardware and operating costs. Optical coherence tomography (OCT) fills the gap, providing good resolution ( $\sim 1\text{-}10\ \mu\text{m}$ ) and penetration depths ( $\sim 1\text{-}3\ \text{mm}$ ) in tissue. OCT measures the light back-reflected from tissue and its constituents providing cross-sectional and 3-dimensional images of its microstructure. In addition, extensions of the OCT technology allow for functional imaging, e.g. hemodynamics and molecular imaging. Combined functional and structural imaging in this regime could become a powerful tool for small animal and tissue studies.

**Dr. Costas Pitris** is currently an Associate Professor in the Department of Electrical and Computer Engineering of the University of Cyprus. He is heading the "Biomedical Imaging and Applied Optics Laboratory" which he established in 2004. Dr. Pitris has completed his studies at the University of Texas at Austin (BS Honors in Electrical Engineering, 1993, MS in Electrical Engineering, 1995), Massachusetts Institute of Technology (Ph.D. in Electrical and Medical Engineering, 2000), and Harvard Medical School (MD Magna Cum Laude, Medicine, 2002). His main research interests cover the areas of optical diagnostics and biomedical imaging and include techniques such as Optical Coherence Tomography (OCT), nanoparticle-based Surface Enhanced Raman Spectroscopy (SERS) and advanced computational techniques. Dr. Pitris has published 39 peer reviewed journal publications, 99 conference proceedings, 4 book chapters, 1 book, and 8 US and other patents. The citations to this work have reached more than 4100 according to the Scopus Citation Report (with an h-index of 25.)

## *Ms. Elina Demetriadou*

BIG data in Neuro-Intensive Care: Combining the CREATiVE clinical database for severe Traumatic Brain Injury with Biomedical signals, follow up indices and genetic data

### **Abstract:**

Traumatic brain injury (TBI) is among the leading causes of death and disability and the main cause of death among patients under 45 years of age. Most patients with moderate to severe TBI are admitted to Intensive Care Units (ICUs). The "PROSAFE" ICU networks were recently established in 6 European countries through EU funding (PHEA 2007331), and still collect high-quality data, beyond the grant duration. In 2011, 225 ICUs joined PROSAFE, recruiting a total of 73,163 patients, 2,694 of whom were admitted for TBI. Hence the network can expect to enrol 7,000-9,000 moderate to severe TBI patients (Collaborative REsearch on ACute Traumatic brain Injury in intensiVe care medicine in Europe, CREATiVE project) over the 4 years of the programme duration. The objectives of the project (CREACTIVE) are to consolidate the existing network (PROSAFE) in order to better describe the epidemiology of moderate-severe TBI in 7 countries build a prognostic model based on short- and long-term outcome measures; identify the most effective clinical interventions for optimally treating TBI patients, and recognize the determinants of optimal vs suboptimal performance. To that aim current data retrieval, processing and analysis workflows must be enhanced with state of the art Big Data Analytics technologies. Big data analytics can play a major role in formulating new hypotheses and in preliminary testing them in large datasets, providing better understanding of vast quantities of high-fidelity data (including medical text, physiological parameters/ waveforms, treatment, imaging and outcome data) generated during TBI treatment.

**Elina Demetriadou** is a Health Psychologist currently working for the Intensive Care Forum in the Intensive Care Unit of Nicosia General Hospital since 2010. She has experience in the assessment and implementation of psychotherapeutic interventions with patients and their families, particularly those who struggle through grief, loss and bereavement. Her research interests have led her to develop a service (*ARIADNE* funded by EEA GRANTS) providing tele-psychological support to the underage family members of patients hospitalised in the ICU. Her goal is to apply early intra-ICU individualized psychological interventions to decrease the prevalence of psychopathology. She is also the Coordinator of *CREACTIVE* follow up team which performs diagnostic interviews assessing former TBI patients' condition using psychometric tools. In addition, she was a member of the project *TELEPROMETHEUS* developing educational material and videos for the platform to serve as an information kiosk for ICU visitors. She was also member of *TELEREHABILITATION*, a project which aimed to develop an innovative cardiopulmonary rehabilitation service, using telemedicine for patients after their discharge from the ICU. Mrs Demetriadou has received her BSc in Psychology and MSc in Health Psychology from Middlesex University and is nearing her completion of professional diploma in Integrative Psychotherapy. She has been working as a trainee psychotherapist from 2010 in private practice settings.

## *Prof. Andreas Demetriou*

### Reconconceptualization cycles in the mind and the brain: A comprehensive theory

#### **Abstract:**

This talk summarizes a comprehensive theory of intellectual organization and growth. The theory specifies a common core of processes (Abstraction, representational Alignment, and Cognizance, i.e., AACog) underlying inference and meaning making. AACog develops over four reconceptualization cycles (episodic representations, representations, rule-based concepts, and principle-based concepts starting at birth, 2, 6, and 11 years, respectively) with two phases in each (production of new mental units and alignment). This sequence relates with changes in processing efficiency and working memory in overlapping cycles such that relations with efficiency are high in the production phases and relations with WM are high in the alignment phases over all cycles. Each cycle culminates into insight about the cycle's representations and underlying inferential processes that is expressed into executive programs of increasing flexibility. There is no research explicitly connecting these cycles with differential patterns in brain development. However, there are brain changes that may be related. For example, transitions across cycles may relate to the establishment of the brain networks (as reflected in EEG coherency and power) necessary to project representational alignments of an earlier cycle into the more abstract networks capturing the new units that emerged from these alignments. Also, transitions across cycles may relate to changes in inter-regional and inter-hemispheric connectivity and changes across phases within cycles may relate to changes in the intra-hemispheric and intra-regional connectivity of the brain that allows alignment and integration of representations. These patterns will be discussed and suggestions for future research will be proposed.

**Prof. Andreas Demetriou** is Professor of Psychology and President of the University of Nicosia Research Foundation and an Honorary Professor of Durham University, UK. He was a professor of psychology at Aristotle University of Thessaloniki, Greece, (1975-1996), and the University of Cyprus (1996-2008). He served in top academic or administrative positions, such as Vice-Rector of the University of Cyprus, President of the Cyprus University of Technology, President of the Conference of Rectors of the Universities of Cyprus and also Minister of Education and Culture of Cyprus. He developed a theory of intellectual development integrating the developmental, psychometric, and cognitive traditions and he is currently working along several lines, including basic processes underlying different cognitive domains and the educational implications of the theory. This work is published in more than 180 books and articles.



# POSTERS

1	Panayiotou, G., Theodorou, M. & Neophytou, K.	Identifying sub-categories of social fears and worries using the factor analytic structure of the Greek version of the Social Phobia and Anxiety Inventory
2	Pantelides, S.	Integration of spatial information across vision and language
3	Paraskeva - Siamata, M., Stavrinaki, M., Karekla, M., Constantinou, S.C., Loizou, C., Fellas, C. & Christou, S.	Factors that influence QoL in thalassemia patients: Examining potential moderators
4	Koutsogiorgi, C.C., Michaelides, P.M., Panayiotou, G. & Panteli, M.	Method Effects due to Item Wording on the Greek Version of the Rosenberg Self-Esteem Scale and Personality Correlates
5	Stavrinides, P. & Souroulla Kay, S.	Psychopathic Traits and Bullying Among Adolescents
6	Leonidou, C., Panayiotou, G., Bati, A., & Karekla, M.	Correlates and Predictors of Severe Health Anxiety
7	Naziri, S., Theodorou, C., Georgiou, D. & Panayiotou, G.	A pilot study: Using Virtual Reality as Therapy for Public Speaking Phobia
8	Constantinidou, F., Prokopiou, J. & Nikou, M.	Neurocognitive Aging and Quality of Life in Greek Cypriot Adults: The Neurocognitive Study for the Aging
9	Kkeli, N., Michaelides, M. & Karekla, M.	Evidence Regarding the Factorial Structure of the Restraint Scale
10	Hatzipanayioti, A., Galati, A. & Avraamides, M.	Encoding spatial information from narratives
11	Metaxas, G.	Social Cognition and ageing. A developmental perspective of the ability to recognize emotions and emotional states in others during adulthood
12	Agathocleous, A. & Spanoudis, S.	Rearranging temporal sequence of events: An ERP study
13	Charalambous E., Theodorou M. & Panayiotou G.	Methods of coping with Social Anxiety symptoms in a smoking population
14	Tourva, A. & Spanoudis, G.	Cognitive correlates of intelligence in children

# POSTERS

15	Alkiviadous, C., Constantinidou, F. & Stavrinides, P.	Medical and Psychosocial Aspects of Epilepsy in Children and Adolescents: A systematic review of literature
16	Konstantinou, N.	The Role of Attentional Load in Processing Distractor Faces in Social Anxiety
17	Konstantinou, N.	Attentional load modulates face valence perception
18	Papadopoulos, C.T., Kendeou, P. & Spanoudis, G.	Reading comprehension and intelligence: Implications for definitional models of reading development
19	Chadjikyprrianou, A. & Constantinidou, F.	Cognitive health predicts cognitive performance at 4 year follow up: Findings from the neurocognitive Study of Aging
20	Demetriou, F., Zalonis, I., Evdokimidis, I. & Constantinidou, F.	Cognitive impairments in Greek adults with epilepsy: A preliminary study
21	Panayiotou, G., Karekla, M. & Christou-Champi, S.	Addicted Heart: Variability of cardiac output and smoking urges
22	Petteimeridou, E., Konstantinou, N. & Constantinidou, F.	Assessing the relationship between working memory and executive functions in patients with chronic traumatic brain injury
23	Ioannou, M.	Exploring the possible impact of computer games on the cognitive and learning processes of young children with ADHD
24	Ioannides, A.A., Poghosyan V. & Liu, L.	An expanded range of applications for MEG through personalized medicine
25	Liu, L., Ioannides, A.A., Poghosyan, V., Saridis, G., Gjedde, A., Ptito, M. & Kupers, R.	Do blind subjects use visual areas to process sensory stimuli?
26	Poghosyan, V. & Ioannides, A.A.	Neural correlates of auditory and somatosensory evoked K-complexes
27	Ioannides, A.A.	From research in basic neuroscience to the Clinic and Market



