
PROGRAM AND ABSTRACTS

Research Work of Postgraduate Students Faculty of Pure and Applied Sciences University of Cyprus

Department of Biological Sciences
Department of Chemistry
Department of Computer Science
Department of Mathematics and Statistics
Department of Physics

Social Facilities Center, Room 010

November 16-17, 2012

<http://www.ucy.ac.cy/goto/puapsi/el-GR/ResearchWorkPostgrad.aspx>



Organizing Committee

Vasiliki Christou, Department of Mathematics and Statistics

Maria Efstathiou, Department of Chemistry

Gewrgios Kwnstantinou, Department of Physics

Nicholas Loulloudes, Department of Computer Science

Christoforos Odiatis, Department of Biological Sciences

SCHEDULE

Friday, 16th November 2012

- 08:45 - 08:50 Greeting from the Dean of the Faculty of Pure and Applied Sciences, Prof. Efstathios Papparoditis
08:50 - 09:00 Greeting from the Rector of the University of Cyprus, Prof. Constantinos Christofides

Keynote Talk

- 09:00 - 10:00 Computing the Universe to Understand the Cosmic Lives of Galaxies
George Lake, Institute for Theoretical Physics, University of Zürich

Session I

- 10:00 - 10:15 Identifying Clusters With Attributes Homogeneity and Similar Connectivity Patterns in Information Networks
Marios D. Dikaiakos, George Pallis, Andreas Papadopoulos, Department of Computer Science
- 10:15 - 10:30 Lehmer's Problem
Pantelis Damianou, Charalambos A. Evripidou, Department of Mathematics and Statistics
- 10:30 - 10:45 Development of Regulatory Compounds for the Complement System by MD Simulations and Experiments
Georgios Archontis, Phanouris Tamamis, Department of Physics
- 10:45 - 11:00 Continuous All k-nearest Neighbor Querying in Smartphone Networks
Georgios Chatzimilioudis, Marios D. Dikaiakos, Wang-Chien Lee, Demetrios Zeinalipour-Yazti, Department of Computer Science
- 11:00 - 11:15 Molecular Cloning and Functional Characterization of *Xenopus laevis* Nucleotide Binding Protein 1 (Nubp1) During Embryonic Development
Andriani Ioannou, Niovi Santama, Paris A. Skourides, Department of Biological Sciences
- 11:15 - 11:30 **Break**

Session II

- 11:30 - 11:45 Novel Catalytic Systems for Hydrogen Production via the Water-Gas Shift Reaction
Angelos M. Efstathiou, Klito C. Petalidou, Kyriaki Polychronopoulou, Department of Chemistry
- 11:45 - 12:00 Resonance Raman Intensity Analysis of $CINO_2$ Dissolved in Methanol
Sophia C. Hayes, Marilena Trimithioti, Department of Chemistry
- 12:00 - 12:15 Role of calpain2 Protease in *Xenopus Laevis* Development
Neophytos Christodoulou, Sara Zanardelli, Paris A. Skourides, Department of Biological Sciences
- 12:15 - 12:30 Light Harvesting Using Hybrids of Colloidal Quantum Dots and Conjugated Polymers
Gregorios Itskos, Paris Papagiorgis, Department of Physics
- 12:30 - 12:45 Networks Research Laboratory Activities
Andreas Pitsillides, Vasos Vasilliou, Department of Computer Science
- 12:45 - 14:15 **Lunch Break**
- 14:15 - 15:15 **Poster Session**

SCHEDULE

Session III

- 15:15 - 15:30 Equol Enhances Tamoxifen's Anti-tumor Activity via Activation of Caspase-mediated Apoptosis in MCF-7 Breast Cancer Cells
Christiana Charalambous, Andreas I. Constantinou, Department of Biological Sciences
- 15:30 - 15:45 Integrating Transcriptomic and Genetic Approaches to Identify Novel Mediators of Breast Cancer Metastasis
Andreas I. Constantinou, Panos Papageorgis, Thiagalingam, Department of Biological Sciences
- 15:45 - 16:00 Insertion of Functional Groups into a Nd^{3+} Metal–Organic Framework via Single-Crystal-to-Single-Crystal Coordinating Solvent Exchange
Manos Emmanouil, Eleni Kyprianidou, Anastasios Tasiopoulos, Department of Chemistry
- 16:00 - 16:15 Reinforcement Learning
Savvas Karatsiolis, Department of Computer Science
- 16:15 - 16:30 **Break**

Session IV

- 16:30 - 16:45 Embryonic and Extraembryonic Development
Pantelis Georgiades, Department of Biological Sciences
- 16:45 - 17:00 Heterometallic $Mn_{36}Ni_4$ 'loop-of-loops-and-supertetrahedra' aggregates possessing a high - spin ground state
Maria Charalambous, George Christou, Eleni E. Moushi, Vasilios Nastopoulos, Constantina Papatriantafyllopoulou, Anastasios J. Tasiopoulos, Wolfgang Wernsdorfer, Department of Chemistry
- 17:00 - 17:15 $so(p,q)$ Toda Systems
Stelios Charalambides, Evripidou Charalambos, Pantelis Damianou, Department of Mathematics and Statistics
- 17:15 - 17:30 Region Based Support Vector Machine Algorithm
Savvas Karatsiolis, Christos Schizas, Department of Computer Science

SCHEDULE

Saturday, 17th November 2012

Keynote Talk

09:00 - 10:00 From Reading to Writing (and Rewriting) the Code of Life: the Future of Biology - Scientific, Ethical, Legal, Civil and Social Issues
Christos Ouzounis, CERTH-Greece, CCB-University of Toronto, Canada

Session I

10:00 - 10:15 V-Sense: A Vehicular Sensor Network Infrastructure
Marios D. Dikaiakos, Nicholas Louloudes, George Pallis, Department of Computer Science

10:15 - 10:30 A Numerical Study of the Compressible Newtonian Extrudate-swell Flow
Georgios Georgiou, Zacharias Kountouriotis, Evan Mitsoulis, Department of Mathematics and Statistics

10:30 - 10:45 A Code Within "the code"? Novel Computational Approaches for Studying the Relationships Between mRNA Sequence and Protein Synthesis/Structure
Vasilis J. Promponas, Athina Theodosiou, Department of Biological Sciences

10:45 - 11:00 Predicting Pathogenicity of Escherichia Strains Based on (Partial) Genome Data and Measures of Global and Local Compositional Bias
Ioannis Kirmitzoglou, Vasilis J. Promponas, Department of Biological Sciences

11:00 - 11:15 Sequence Features Of Compositionally Biased Regions in Three Dimensional Protein Structures
Ioannis Kirmitzoglou, Vasilis J.Promponas, Stella Tamana, Department of Biological Sciences

11:15 - 11:30 **Break**

Session II

11:30 - 11:45 Assisting Automatic Execution of Docking Experiments
Ioanna Kalvari, Vasilis J. Promponas, Department of Biological Sciences

11:45 - 12:00 Spectroscopic Studies of the Myoglobin-catalyzed Lipid Peroxidation and its Inhibition by Vitamin C.
Andreas Loullis, Eftychia Pinakoulaki, Department of Chemistry

12:00 - 12:15 Structural Properties and Dynamics of the Signal Transducer Protein HemAT as Revealed by Time-Resolved Step Scan FTIR Spectroscopy
S. Aono, Andrea Pavlou, E. Pinakoulaki, H. Yoshimur, Department of Chemistry

12:15 - 12:30 Using di-muons Data of the Same Charge, to Study a Mass of Higgs Boson in the NMSSM Theory
Aimilios Ioannou, Fotios Ptohos, Department of Physics

12:30 - 12:45 Using Computational Intelligence Techniques in Software Project Scheduling and Team Staffing
Andreas S. Andreou, Simos Gerasimou, Constantinos Stylianou, Department of Computer Science

12:45 - 14:15 **Lunch Break**

14:15 - 15:15 **Poster Session**

SCHEDULE

Session III

- 15:15 - 15:30 Synthesis of Inherently Chiral Trisadducts of C_{60} with *e,e,e* Addition Pattern: Study of Their Catalytic Activity in Photochirogenesis
Nikos Chronakis, Demetra Georgiou, Department of Chemistry
- 15:30 - 15:45 Gauge Structures and Topological Aspects in Recently Discovered Exotic Materials: Unifying Principles Relating High-Energy and Condensed Matter Physics
Georgios Kwnstantinou, Konstantinos Mouloupoulos, Department of Physics
- 15:45 - 16:00 Lie Symmetries and Differential Equations
Kyriakos Charalambous, Christodoulos Sophocleous, Department of Mathematics and Statistics
- 16:00 - 16:15 Synthesis of Bioactive Organic Molecules
Savvas N. Georgiades, Department of Chemistry
- 16:15 - 16:30 **Break**

Session IV

- 16:30 - 16:45 Effect of HPV16 E6 and E7 Expression on Multipotent Epithelial Progenitors
Styliani Michael, Katerina Strati, Department of Biological Sciences
- 16:45 - 17:00 Intestinal Inflammation and Cancer: Lessons From Fruitflies
Chrysoula Pitsouli, Department of Biological Sciences
- 17:00 - 17:15 Intelligent Search in Social Communities of Smartphone Users
Christos Aplitsiotis, Andreas Konstantinidis, Demetrios Zeinalipour-Yazti, Department of Computer Science
- 17:15 - 17:30 Specific Interactions of Sodium Salts With Alanine Dipeptide and Tetrapeptide in Water: Insights from Molecular Dynamics
Georgios Archontis, Filippos Ioannou, Epameinondas Leontidis, Department of Chemistry
- 17:30 - 17:45 Supporting Adaptive Interactive Systems with Semantic Mark-ups and Human Factors - The case of Smartag
Marios Belk, Panagiotis Germanakos, Efi Papatheocharous, George Samaras, George Spanoudes, Department of Computer Science

TALKS

Friday, 16/11/2012**09:00-10:00****Keynote Talk**

Chair: Efstathios Papanoditis

O-1: Computing the Universe to Understand the Cosmic Lives of Galaxies*Presenter:*

George Lake, Institute for Theoretical Physics, University of Zürich

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Simulations play multiple roles in science. They may elucidate fundamental phenomena such as why proteins fold quickly or how astrophysical structures from the solar system through large scale structure form and evolve.

In cosmology, we have massive past and future surveys that need large cosmological simulations to determine the equation of state of dark matter.

By using telescopes as time machines ("long way is far ago"), we see how galaxies have evolved with time. Simulations also allow us to understand the milestones in the cosmic lives of galaxies: birth, merging, harassment and cannibalism.

Friday, 16/11/2012**10:00-11:15****Session I**

Chair: Maria Efstathiou

O-2: Identifying Clusters With Attributes Homogeneity and Similar Connectivity Patterns in Information Networks*Authors:*

Marios D. Dikaiakos, George Pallis, Andreas Papadopoulos

Presenter:

Andreas Papadopoulos, Department of Computer Science

andpapad@cs.ucy.ac.cy

With the rapid emerge of internet world, a lot of information networks are becoming available every day. These information networks, in many cases, contain different type of objects, connected by multiple weighted links and described by different attributes. The analysis of such networks can be of great help to many applications. Clustering these objects in groups with similar properties and connections in such networks is a challenging task due to their large size and particularities of different relationships and attributes. It is clear that different kind of links and different attributes have different importance. This work presents these challenges and a fuzzy clustering model is proposed. Extensive experimentation with real world datasets has shown that the proposed approach can be successfully applied in such networks, demonstrating its efficiency and superiority against the state-of-the-art attributed graph clustering methods.

O-3: Lehmer's Problem*Authors:*

Pantelis Damianou, Charalambos A. Evripidou

Presenter:

Charalambos A. Evripidou, Department of Mathematics and Statistics

evripidou.charalambos@ucy.ac.cy

For a polynomial $f(x) \in \mathbb{Z}[x]$ multiply the absolute values of those roots of f that lie outside the unit circle and call that number the Mahler measure of f , $M(f)$. You can verify that for the polynomial

$$L(x) = x^{10} + x^9 - x^7 - x^6 - x^5 - x^4 - x^3 + x + 1$$

we have $M(L) = 1.17628\dots$. The subject of our talk will be about the question "Are there any polynomials with $1 < M(f) < M(L)$?" known as Lehmer's problem.

O-4: Development of Regulatory Compounds for the Complement System by MD Simulations and Experiments

Authors:

Georgios Archontis, Phanouris Tamamis

Presenter:

Phanouris Tamamis, Department of Physics

phtamamis@yahoo.com

Using Molecular Dynamics (MD) simulations, we have recently suggested an interpretation for the species specificity of Compstatin (its activity against human C3 and inactivity against lower-mammal C3), and succeeded in designing a modified "transgenic" mouse protein aiming at testing AMD disease models in non-primates. Furthermore, using a combination of de novo drug design and MD simulations we recently proposed new compstatin analogs with optimized binding affinity and solubility, relative to known compstatin analogs. The most promising compounds constitute the most potent inhibitors in completed and ongoing experimental studies.

O-5: Continuous All k-nearest Neighbor Querying in Smartphone Networks

Authors:

Georgios Chatzimilioudis, Marios D. Dikaiakos, Wang-Chien Lee, Demetrios Zeinalipour-Yazti

Presenter:

Georgios Chatzimilioudis, Department of Computer Science

gchatzim@gmail.com

Consider a centralized query operator that identifies to every smartphone user its k geographically nearest neighbors at all times, a query we coin Continuous All k-Nearest Neighbor (CAkNN). Such an operator could be utilized to enhance public emergency services, allowing gamers and social networking users to establish virtual reality enhanced interactions. In this paper, we present Proximity, an efficient solution for processing a CAkNN query in a cellular or WiFi network. Proximity does not require any additional infrastructure or specialized hardware and its efficiency is mainly attributed to a smart search space sharing technique we introduce. It is parameter-free and robust in the face of high mobility and skewed distribution of users.

O-6: Molecular Cloning and Functional Characterization of *Xenopus laevis* Nucleotide Binding Protein 1 (Nubp1) During Embryonic Development

Authors:

Andriani Ioannou, Niovi Santama, Paris A. Skourides

Presenter:

Andriani Ioannou, Department of Biological Sciences

andrea_ioannou83@hotmail.com

Nucleotide binding protein 1 (Nubp1) is a highly conserved phosphate loop (P-loop) ATPase. Previous research has shown that Nubp1 is indispensable for normal cellular function. However, to date, no study has explored the role of Nubp1 during embryogenesis. Our aim has been the molecular cloning and functional characterization of *Xenopus laevis* Nubp1 (xNubp1) *in vivo*. We have investigated the spatial and temporal expression of xNubp1, used sophisticated imaging systems to image xNubp1 in live cells and embryos and carried out gain and loss-of-function experiments. Our knockdown data has revealed that xNubp1 is involved in ciliogenesis and the morphogenetic cell movements that are important for neural tube closure.

Friday, 16/11/2012**11:30-12:45****Session II**

Chair: Nicholas Loulloudes

O-7: Novel Catalytic Systems for Hydrogen Production via the Water-Gas Shift Reaction

Authors:

Angelos M. Efstathiou, Klito Petalidou, Kyriaki Polychronopoulou

Presenter:

Klito Petalidou, Department of Chemistry

petalidou.klita@ucy.ac.cy

The Water-Gas Shift reaction ($CO + H_2O \rightleftharpoons CO_2 + H_2, \Delta H^0 = -41 kJ/mol$) is an important part of the reaction network

for hydrogen production through steam reforming of hydrocarbons, sugar, alcohols and bio-oil. It can be used to produce H_2 and reduce the level of CO in the hydrogen product stream to less than 10 ppm, thus ideal to be used in fuel cells for electricity production. The present industrial catalysts used for WGS reaction (Fe_3O_4/Cr_2O_3 and $Cu/ZnO/Al_2O_3$) present several drawbacks, such as pyrophoricity and deactivation if exposed to air and condensed water. This study concerns the synthesis and characterization of novel catalytic systems and their evaluation towards the WGS reaction, in particular supported platinum catalysts ($Pt/Ce_{1-x}La_xO_{2-\delta}$, $Pt/Ce_{1-x}Ti_xO_{2-\delta}$, $Pt/Ce_{1-x}La_xO_{2-\delta}/CNT$ and $Fe/Ce_{1-x}La_xO_{2-\delta}$ (where, CNT: Carbon Nano-Tubes, $x = 0.0, 0.2, 0.5, 0.8$ and 1.0). A detailed physicochemical characterization of catalysts using the techniques: BET, *in-situ* XRD, *in-situ* Raman, SEM, HRTEM, *in-situ* UV-vis/DRS, XPS, TPD-NH₃, TPD-CO₂, H₂-TPR and TPD-H₂ to correlating the physicochemical properties of catalysts with their catalytic activity (CO conversion, X_{CO} , %) will be presented. Transient isotopic experiments (SSITKA-MS-DRIFTS) were used to determine the concentration and chemical structure of *active* reaction intermediate species in WGS, in an effort to better understand the mechanism of the WGS reaction and improve catalyst performance.

O-8: Resonance Raman Intensity Analysis of $ClNO_2$ Dissolved in Methanol

Authors:

Sophia C. Hayes, Marilena Trimithioti

Presenter:

Marilena Trimithioti, Department of Chemistry

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Resonance Raman (RR) spectra of $ClNO_2$ dissolved in methanol after excitation within the $1^1A_1 - 2^1A_1$ absorption band are presented, where RR intensity is only observed along the NO symmetric stretch coordinate at 1291 cm^{-1} . RRIA reveals that two closely-spaced excited electronic states contribute to the scattering, which are dissociative along the Cl-N coordinate. This investigation provides insights on the phase-dependent photoreactivity of $ClNO_2$.

O-9: Role of calpain2 Protease in *Xenopus Laevis* Development

Authors:

Neophytos Christodoulou, Sara Zanardelli, Paris A. Skourides

Presenter:

Sara Zanardelli, Department of Biological Sciences

sarazanna78@yahoo.it

Calpain2 is an intracellular cysteine protease that regulates a variety of signaling pathways via precise and limited cleavage of specific proteins. We investigated its role during *Xenopus Laevis* development. We studied its temporal and spatial expression in the embryos via RT-PCR and whole-mount *in situ* hybridization. We specifically silenced the function of calpain2 using a morpholino-oligonucleotide. Morpholino-injected embryos showed delays in blastopore closure, flattening of the neural folds and delays in their closure, leading to shorter and curvy tailbuds with loss of anterior structures and melanocyte pigmentation. Overall, these results suggest the importance of calpain2 activity during *Xenopus* gastrulation and neurulation.

O-10: Light Harvesting Using Hybrids of Colloidal Quantum Dots and Conjugated Polymers

Authors:

Gregorios Itskos, Paris Papagiorgis

Presenter:

Paris Papagiorgis, Department of Physics

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Semiconductors (SMs) are the basis of today's electronics (chips, transistors) and optoelectronics (photovoltaics, LEDs, LASERS). Conventional crystalline SMs like silicon require a relative expensive process of fabrication. New solution processed SMs offer a unique combination of novel properties that include ease of fabrication, flexibility, tunability, light weight and large surface coverage. The presentation will focus on the optical properties of two important classes of solution processed SMs, namely quantum dots and polymers, and their hybrid combinations for applications in light harvesting.

O-11: Networks Research Laboratory Activities

Authors:

Andreas Pitsillides, Vasos Vasilliou

Presenter:

Vasos Vasilliou, Department of Computer Science

vasosv@cs.ucy.ac.cy

Wireless Networks, Game Theory, Congestion Control in Wireless Sensor Networks, Mobility Management.

Friday, 16/11/2012

15:15-16:15

Session III

Chair: Christoforos Odiatis

O-12: Equol Enhances Tamoxifen's Anti-tumor Activity via Activation of Caspase-mediated Apoptosis in MCF-7 Breast Cancer Cells

Authors:

Christiana Charalambous, Andreas I. Constantinou

Presenter:

Christiana Charalambous, Department of Biological Sciences

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Soy phytoestrogens, such as daidzein and its metabolite equol, have been proposed to possess anti-cancer properties. Since the majority of estrogen-dependent breast cancer patients are treated with tamoxifen, the basic objective of our project is to determine whether equol enhances or inhibits tamoxifen's anti-tumor effect and to identify the molecular mechanisms involved. Our results demonstrate that in the estrogen-dependent MCF-7 breast cancer cells, equol enhances tamoxifen-induced apoptosis via activation of the intrinsic (mitochondrial) apoptotic pathway.

O-13: Integrating Transcriptomic and Genetic Approaches to Identify Novel Mediators of Breast Cancer Metastasis

Authors:

Andreas I. Constantinou, Panos Papageorgis, Thiagalingam

Presenter:

Panos Papageorgis, Department of Biological Sciences

panos_pap@hotmail.com

It is widely accepted that cancer metastasis is the main cause for the majority of breast cancer patient deaths. Despite recent advances and the identification of various metastasis gene signatures, the molecular mechanisms that control dissemination of cancer cells to secondary tissues remain largely elusive. In this study, we performed gene expression DNA microarray analysis in a human cancer cell line model system for breast cancer progression, followed by *in silico* meta-analysis of relevant microarray data from human breast tumours to identify potential metastasis promoting or suppressor genes. The breast cancer model cell lines were then stably transduced with the luciferase gene and the selected candidate genes were genetically manipulated in these cells. *In vivo* metastasis assays coupled with whole body bioluminescence imaging were used to assess the functional role of particular genes in metastatic disease.

O-14: Insertion of Functional Groups into a Nd^{3+} Metal-Organic Framework via Single-Crystal-to-Single-Crystal Coordinating Solvent Exchange

Authors:

Manos Emmanouil, Eleni Kyprianidou, Anastasios Tasiopoulos

Presenter:

Eleni Kyprianidou, Department of Chemistry

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We here in present a new $MOF[Nd_2(CIP)_2(DMF)_{2.8}(H_2O)_{1.2}]$ denoted as **UCY-2** (UCY = University of Cyprus) that was prepared from the initial use of a semi-rigid tricarboxylic ligand H_3CIP [H_3CIP = 5-(4-carboxybenzylideneamino)isophthalic acid]. It exhibits a flexible 3D-porous structure and an extraordinary capability to undergo a series of Single-Crystal-to-Single-Crystal (SCSC) transformations. The latter comprise the exchange of the coordinating and / or guest solvent molecules of **UCY-2** by a) terminally ligating solvent molecules and organic ligands with multiple functional groups, b) chelating organic ligands, c) anions, d) two different organic molecules and e) guest solvent molecules. The facile solvent exchange properties of **UCY-2** resulted in the insertion of a variety of unbound functional groups into the framework structure, including functionalities such as -SH that have not been previously introduced into the structure of any MOF. Overall, this work demonstrates the SCSC solvent exchange as a powerful method for the functionalization of MOFs.

O-15: Reinforcement Learning

Authors:

Savvas Karatsiolis

Presenter:

Savvas Karatsiolis, Department of Computer Science
karatsioliss@cytanet.com.cy

The concepts behind reinforcement learning and its evolution through recent years: from dynamic programming approaches to the application of reinforcement learning with function approximation for large and continuous state space problems that cannot be solved through discretization.

Friday, 16/11/2012**16:30-17:30****Session IV**

Chair: Gewrgios Kwnstantinou

O-16: Embryonic and Extraembryonic Development

Authors:

Pantelis Georgiades

Presenter:

Pantelis Georgiades, Department of Biological Sciences
pgeor@ucy.ac.cy

Summary of the research in the Georgiades lab. It is concerned with the genetic and cellular basis of mammalian embryonic and extraembryonic development as well as the influences of extraembryonic tissues on embryo development and viability, using the mouse as a model organism.

O-17: Heterometallic $Mn_{36}Ni_4$ 'loop-of-loops-and-supertetrahedra' aggregates possessing a high - spin ground state

Authors:

Maria Charalambous, George Christou, Eleni E. Moushi, Vasilios Nastopoulos,
Constantina Papatriantafyllopoulou, Anastasios J. Tasiopoulos, Wolfgang Wernsdorfer

Presenter:

Maria Charalambous, Department of Chemistry
charalambous.i.maria@ucy.ac.cy

Polynuclear clusters of paramagnetic transition-metal ions attract significant attention mainly due to their aesthetically-pleasing structures and the often unusual and sometimes novel magnetic properties. One important challenge for coordination chemists is the utilization of polynuclear complexes with interesting magnetism for the construction of large clusters or polymeric networks. However, although there are a few coordination polymers composed of magnetically interesting repeating Mn_3 , Mn_4 , Mn_6 , Mn_{10} , Mn_{17} and Mn_{19} units, the list of discrete polynuclear complexes containing such "building - blocks" is very small, being limited mainly to some polynuclear clusters comprising linked trinuclear units.

We recently reported a family of large molecular aggregates consisting of four smaller clusters linked through Na^+ or Mn^{2+} ions. These large tetrameric $[Mn_{10}M(\mu_3-O)_2(O_2CCH_3)_3(pd)_6(py)_2]_{4^{x+}}$ ($\mathbf{Mn}_{40}\mathbf{M}_4$; pd = the dianion of 1,3-propanediol; $M = Na^+$, $x = 0$; $M = Mn^{2+}$, $x = 1$), clusters contain four Mn_{10} loops linked through Na^+ or Mn^{2+} ions. Further investigations on the reactions that afforded the $\mathbf{Mn}_{40}\mathbf{M}_4$ clusters involved the use of other 3d paramagnetic metal ions in an attempt to isolate new heterometallic Mn/3d analogues. We shall describe the results from these investigations which include a new family of $\mathbf{Mn}_{36}\mathbf{Ni}_4$ and $\mathbf{Mn}_{36}\mathbf{CO}_6$ aggregates. The $\mathbf{Mn}_{36}\mathbf{Ni}_4$ cluster possesses an unprecedented loop of loops and supertetrahedra structural topology and displays a high spin ground state $S_T = 26 \pm 1$, the highest yet observed for a mixed metal cluster.

O-18: so(p,q) Toda Systems

Authors:

Stelios Charalambides, Evripidou Charalambos, Pantelis Damianou

Presenter:

Stelios Charalambides, Department of Mathematics and Statistics
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We define an integrable Hamiltonian system of Toda type associated with the real Lie algebra $so(p,q)$. As usual there exists a periodic and a non-periodic version. We construct, using the root space, two Lax pair representations and the associated Poisson tensors. We prove Liouville integrability and examine the multi-hamiltonian structure. The system is a projection of a canonical An type Toda lattice via a Flaschka type transformation. It is also obtained via a complex change of variables from the classical Toda lattice.

O-19: Region Based Support Vector Machine Algorithm

Authors:

Savvas Karatsiolis, Christos Schizas

Presenter:

Savvas Karatsiolis, Department of Computer Science

karatsioliss@cytanet.com.cy

Proposing a new classification methodology based on clustering the training data set to appropriate subsets that are suitable for training different support vector machine models. The clustering is based on a genetic algorithm running multiple support vector machines to discover data clusters. During the classification of an unknown pattern the algorithm is able to select the most appropriate support vector machine model obtained during training.

Saturday, 17/11/2012**09:00-10:00****Keynote Talk**

Chair: Angelos Efstathiou

O-20: From Reading to Writing (and Rewriting) the Code of Life: the Future of Biology - Scientific, Ethical, Legal, Civil and Social Issues*Presenter:*

Christos Ouzounis, CERTH-Greece, CCB-University of Toronto, Canada

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The rapid progress in DNA sequencing technology is poised to transform the management of human health and disease. The findings of the human genome sequence have expanded from genetics into human variation, pharmacogenomics and clinical practice. These overarching implications have revealed certain ethical, legal and social issues that will need to be addressed by society at large. We review basic ideas in large-scale biology, the deciphering of our own genome, examples of mini-breakthroughs in medicine, and the vast quantities of data that have emerged from sequencing. We are now at a point where instead of addressing therapies, we are uncovering genetic variations less prone to disease. The management of human health and well-being is impacted by the genomic revolution. Human genome equivalent quantities are of the order of thousands and probably soon millions. This wealth of information can transform patient management from general practice to personalized medicine and personal genomics. Patient and citizen participation in this endeavour become essential. Thus, as modern medicine concentrates on the p4 concept - predictive, preventive, personalized and participatory - it will require a totally different approach from traditional practice. Precision and effectiveness will become key. Differential and early diagnosis are within reach, with low cost and high accuracy. Patients and citizens will not only request access rights to data but will probably demand right of exchange of genetic information. We will thus be moving from a 'subject' to a 'consumer' role, with significant implications for clinical genetics.

Saturday, 17/11/2012**10:00-11:15****Session I**

Chair: Vasiliki Christou

O-21: V-Sense: A Vehicular Sensor Network Infrastructure*Authors:*

Marios D. Dikaiakos, Nicholas Loulloudes, George Pallis

Presenter:

Nicholas Loulloudes, Department of Computer Science

loulloudes.n@cs.ucy.ac.cy

The V-Sense project aims to improve the performance of Vehicular Sensor Networks(VSN), by studying the dynamics and topology of large-scale VSN from the viewpoint of complex networks. Moreover, it Investigates robust location-aware services that will improve the coordination of sensing tasks, large-scale sensor data aggregation and dissemination, query resolution and interconnection with the Internet.

O-22: A Numerical Study of the Compressible Newtonian Extrudate-swell Flow*Authors:*

Georgios Georgiou, Zacharias Kountouriotis, Evan Mitsoulis

Presenter:

Zacharias Kountouriotis, Department of Mathematics and Statistics

zkoyntoy@hotmail.com

The objective of this project is to study numerically the extrudate-swell flow of a homogeneous compressible Newtonian fluid that slips along the wall. In particular we study the combined effects of compressibility, slip and inertia on the shape of the extrudate. Initially the fluid is taken as Newtonian obeying a linear equation of state. In the second phase of this work, we employ the Herschel-Buckley constitutive equation. The model is implemented with a finite element method with an efficient mesh generation scheme.

O-23: A Code Within "the code"? Novel Computational Approaches for Studying the Relationships Between mRNA Sequence and Protein Synthesis/Structure

Authors:

Vasilis J. Promponas, Athina Theodosiou

Presenter:

Vasilis J. Promponas, Department of Biological Sciences

vasilis.promponas@gmail.com

Recent experimental findings underpin the notion that mRNA sequences encode significantly more information than simply an amino acid sequence, influencing translational efficiency and co-translational protein folding. We will present novel computational methods and tools developed in our laboratory for exploiting information in coding sequences, and preliminary applications on the complement of proteins encoded in the *Escherichia coli* genome. I will conclude with discussion on how these methods may enable the prediction of the impact of mRNA sequence features on protein co-translational folding and heterologous expression, and possible new applications.

O-24: Predicting Pathogenicity of Escherichia Strains Based on (Partial) Genome Data and Measures of Global and Local Compositional Bias

Authors:

Ioannis Kirmitzoglou, Vasilis J. Promponas

Presenter:

Ioannis Kirmitzoglou, Department of Biological Sciences

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In this work, we investigate ways to exploit protein coding gene sequences and their compositional features with simple machine learning methods to infer pathogenicity in strains of the genus *Escherichia*. Furthermore, we demonstrate that the most informative encodings retain considerable discriminatory power even when using subsampled genome data. Our findings may be important in the analysis of data from metagenomic pipelines and in designing detailed studies for identifying key features of host-pathogen interactions.

O-25: Sequence Features Of Compositionally Biased Regions in Three Dimensional Protein Structures

Authors:

Ioannis Kirmitzoglou, Vasilis J. Promponas, Stella Tamana

Presenter:

Stella Tamana, Department of Biological Sciences

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A considerable research effort has already been put on the identification (and consequently filtering) of local segments of "unusual" composition (Compositionally Biased or Low Complexity Regions; CBRs or LCRs) in protein sequences. Even though no general biological significance has been demonstrated for CBRs so far, they are often associated with the lack of regular structure. However, application of commonly used methods for CBR detection illustrates that instances of CBRs can be found in proteins with experimentally determined three dimensional structures. Our goal is to shed light on the properties of CBR sequences, with the future prospect of elucidating their relation to protein three dimensional structure.

Saturday, 17/11/2012**11:30-12:45****Session II**

Chair: Nicholas Loulloudes

O-26: Assisting Automatic Execution of Docking Experiments

Authors:

Ioanna Kalvari, Vasilis J. Promponas

Presenter:

Ioanna Kalvari, Department of Biological Sciences

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We introduce pyDock a python wrapper to enable the automatic execution of *in silico* docking experiments, aiming to enhance virtual screening and facilitate discovery of novel drugs or chemopreventive agents. pyDock is a back-end component of LISis, a web-based environment aiming to provide cancer chemoprevention experts with a set of online tools to create,

update, store and share virtual screening Scientific Workflows for the discovery of new chemopreventive agents.

O-27: Spectroscopic Studies of the Myoglobin-catalyzed Lipid Peroxidation and its Inhibition by Vitamin C

Authors:

Andreas Loullis, Eftychia Pinakoulaki

Presenter:

Andreas Loullis, Department of Chemistry
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Lipid peroxidation reactions are a major concern in Food Science because of the changes they cause in flavor, texture, color and producing cytotoxic and genotoxic compounds. Myoglobin has been demonstrated to catalyze lipid peroxidation in biological tissues and muscle-based foods. UV/Vis and FTIR spectroscopies have employed to study the mechanism of myoglobin-catalyzed lipid peroxidation as well as to investigate the antioxidant activity of vitamin C.

O-28: Structural Properties and Dynamics of the Signal Transducer Protein HemAT as Revealed by Time-Resolved Step Scan FTIR Spectroscopy

Authors:

S. Aono, Andrea Pavlou, E. Pinakoulaki, H. Yoshimura

Presenter:

Andrea Pavlou, Department of Chemistry
pavlou.andrea@ucy.ac.cy

HemAT is a heme-based O₂ sensor protein from *B.subtilis* that acts as a signal transducer responsible for aerotaxis. FTIR and time-resolved step-scan (TRS2)-FTIR spectroscopies have been employed to gain insight into the structure and dynamics of the wild type sensor domain and full length HemAT-CO adducts, as well as of the CO-bound T95A, L92A, L92, L92V and Y70F mutants of the protein.

O-29: Using di-muons Data of the Same Charge, to Study a Mass of Higgs Boson in the NMSSM Theory

Authors:

Aimilios Ioannou, Fotios Ptohos

Presenter:

Aimilios Ioannou, Department of Physics
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The lightest CP-odd Higgs boson of the NMSSM, α_1^0 , with mass below $10 \text{ GeV}/c^2$, can escape the limits of the experimental data. Here the lightest Higgs boson with mass $m(\alpha_1^0) = 9 \text{ GeV}/c^2$ decays to lightest CP-even boson $h_1^0, h_1^0 \rightarrow a_1^0 a_1^0$, where $m(h_1^0) = 120 \text{ GeV}/c^2$. Using di-muons data of the same charge, we study the lightest CP-odd Higgs boson at LHC, via $h_1^0 \rightarrow a_1^0 a_1^0 \rightarrow 4\tau^\pm \rightarrow \mu^\pm \mu^\pm jj$ channel.

O-30: Using Computational Intelligence Techniques in Software Project Scheduling and Team Staffing

Authors:

Constantinos Stylianou, Andreas S. Andreou, Simos Gerasimou

Presenter:

Constantinos Stylianou, Department of Computer Science
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The success of software development projects relies heavily on proper project scheduling and team staffing. For software development companies getting the right people to do the right job at the right time is crucial in order to provide their customers with high quality software products on time and within budget. Our research concentrates on using techniques from the area of computational intelligence to provide software project managers automated tools to carry out these activities, taking into account both technical aspects (such as project duration and cost, and developer skills) and non-technical aspects (for instance, human, social and organizational factors) present in software development.

Saturday, 17/11/2012**15:15-16:15****Session III**

Chair: Maria Efstathiou

O-31: Synthesis of Inherently Chiral Trisadducts of C_{60} with *e,e,e* Addition Pattern: Study of Their Catalytic Activity in Photochirogenesis

Authors:

Nikos Chronakis, Demetra Georgiou

Presenter:

Demetra Georgiou, Department of Chemistry
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The present study focuses on the synthesis, characterization of enantiomerically pure trisadducts of C_{60} and the study of their catalytic activity in singlet oxygen (1O_2) photooxygenation reactions of alkenes. Firstly, we synthesized the enantiomerically pure trisadducts of C_{60} with the *e,e,e* addition pattern utilizing the appropriate cyclo-[3]-alkyl malonate tether.^[2,3] Subsequent hydrolysis of the acetal groups of the tether afforded the corresponding enantiomerically pure fullerene polyalcohols with the inherently chiral *e,e,e* addition pattern. These novel fullerene derivatives are currently under investigation in the 1O_2 photooxygenation of alkenes to the corresponding chiral β -hydroxy carboxylic acids.

O-32: Gauge Structures and Topological Aspects in Recently Discovered Exotic Materials: Unifying Principles Relating High-Energy and Condensed Matter Physics

Authors:

Gewrgios Kwnstantinou, Konstantinos Mouloupoulos

Presenter:

Gewrgios Kwnstantinou, Department of Physics
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Graphene, a newly discovered exotic material, is a monolayer graphite in which electrons behave as being effectively massless Dirac Fermions with Fermi velocities about 300 times lower than light velocity. This exotic behaviour leads to the appearance of extraordinary stable quantum measurable quantities such as Hall conductivity or dissipationless electric current at room temperature. We report here the topological aspects which give rise to these new phenomena in conventional and unconventional semiconducting materials.

O-33: Lie Symmetries and Differential Equations

Authors:

Kyriakos Charalambous, Christodoulos Sophocleous

Presenter:

Kyriakos Charalambous, Department of Mathematics and Statistics
kyriakosnj20@gmail.com

Transformation methods are perhaps the most powerful tool currently available in the area of nonlinear partial differential equations. While there is no existing general theory for solving such equations, many special cases have yielded to appropriate changes of variables. Point transformations are the ones which are mostly used. These are transformations in the space of the dependent and the independent variables of a pde. Probably the most useful point transformations of pdes are those which form a continuous Lie group of transformations, which leave the equation invariant. Symmetries of this pde are then revealed, perhaps enabling new solutions to be found directly or via similarity reductions. The classical method of finding Lie symmetries is first to find infinitesimal transformations, with the benefit of linearization, and then to extend these to groups of finite transformations.

O-34: Synthesis of Bioactive Organic Molecules

Authors:

Savvas N. Georgiades

Presenter:

Savvas N. Georgiades, Department of Chemistry
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Our presentation will cover activities and syntheses under way in our Research Laboratory, that aim in preparing new organic molecules with interesting biological properties. In particular we are interested in: (A) Molecules able to act as

modulators of cellular signalling pathways and biological processes. These can be employed to interfere with these pathways or processes in a disease state of the system, to come up with potential drug candidates for various diseases, or chemical probes. (B) Molecules that induce or stabilize a special type of DNA secondary structure, the G-quadruplex. G-rich DNA sequences, able to fold into quadruplex, have been linked to various mechanisms of tumorigenesis. Molecules with the above property can enable the development of new anti-cancer treatments.

Saturday, 17/11/2012
16:30-17:45
Session IV

 Chair: Christoforos Odiatis

O-35: Effect of HPV16 E6 and E7 Expression on Multipotent Epithelial Progenitors
Authors:

Styliani Michael, Katerina Strati

Presenter:

 Styliani Michael, Department of Biological Sciences
 michael.styliani@ucy.ac.cy

Human papillomaviruses (HPVs) infect stratified epithelia, such as those lining the skin and the anogenital tract, by gaining access to the basal layer through a site of wounding. This tropism for the basal layer is intriguing since this is the biological niche for progenitor cells but the exact effect of HPV on these cells is unknown. We propose to examine the effects of E6 and E7 HPV16 viral gene expression on multipotent epithelial populations.

O-36: Intestinal Inflammation and Cancer: Lessons From Fruitflies
Authors:

Chrysoula Pitsouli

Presenter:

 Chrysoula Pitsouli, Department of Biological Sciences
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Drosophila feeding with pathogenic bacteria induces enterocyte cell death, secretion of proinflammatory cytokines and stem cell mediated regeneration to maintain intestinal homeostasis. Interestingly, this homeostatic response can lead to cancer in genetically predisposed animals. I will discuss our recent findings on intestinal inflammation and cancer in *Drosophila* and their implications for human biology and disease.

O-37: Intelligent Search in Social Communities of Smartphone Users
Authors:

Christos Aplitsiotis, Andreas Konstantinidis, Demetrios Zeinalipour-Yazti

Presenter:

 Andreas Konstantinidis, Department of Computer Science
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The bulk of social network applications for smartphones (e.g., Twitter, Facebook, etc.) currently rely on centralized or cloud-like architectures in order to carry out their data sharing and searching tasks. Unfortunately, the given model introduces both data-disclosure concerns (e.g., disclosing all captured media to a central entity) and performance concerns (e.g., consuming precious smartphone battery and bandwidth during content uploads). In this paper, we present a novel framework, coined SmartP2P, for searching objects (e.g., images, videos, etc.) captured by the users in a mobile social community. Our framework, is founded on an in-situ data storage model, where captured objects remain local on their owner's smartphones and searches then take place over a novel lookup structure we compute dynamically, coined the Multi-Objective Query Routing Tree (MO-QRT). Our structure concurrently optimizes several conflicting objectives (i.e., it minimizes energy consumption, minimizes search delay and maximizes query recall), using a Multi-objective Evolutionary Algorithm based on Decomposition (MOEA/D) that calculates a diverse set of high quality non-dominated solutions in a single run. We assess our ideas with mobility patterns derived by Microsoft's Geolife project and social patterns derived by DBLP. Our study reveals that SmartP2P can yield query recall rates of 95%, with one order of magnitude less time and two orders of magnitude less energy than its competitors.

O-38: Specific Interactions of Sodium Salts With Alanine Dipeptide and Tetrapeptide in Water: Insights from Molecular Dynamics*Authors:*

Georgios Archontis, Filippos Ioannou, Epameinondas Leontidis

Presenter:

Filippos Ioannou, Department of Chemistry

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We examine computationally the dipeptide and tetrapeptide of alanine in pure water and solutions of sodium chloride (NaCl) and iodide (NaI), with salt concentrations up to 3 M. Enhanced sampling of the configuration space is achieved by the replica exchange method. In agreement with other works, we observe preferential sodium interactions with the peptide carbonyl groups, which are enhanced in the NaI solutions due to the increased affinity of the less hydrophilic iodide anion for the peptide methyl side-chains and terminal blocking groups. These interactions have been associated with a decrease in the helicities of more complex peptides. In our simulations, both salts have a small effect on the dipeptide, but consistently stabilize the intramolecular hydrogen-bonding interactions and " α -helical" conformations of the tetrapeptide. This behavior and an analysis of the intermolecular interaction energies show that ion-peptide interactions, or changes in the peptide hydration due to salts, are not sufficient determining factors of the peptide conformational preferences. Additional simulations suggest that the observed stabilizing effect is not due to the employed force-field, and that it is maintained in short peptides but is reversed in longer peptides. Thus, the peptide conformational preferences are determined by an interplay of energetic and entropic factors, arising from the peptide sequence and length and the composition of the solution.

O-39: Supporting Adaptive Interactive Systems with Semantic Mark-ups and Human Factors - The case of Smartag*Authors:*

Marios Belk, Panagiotis Germanakos, Efi Papatheocharous, George Samaras, George Spanoudes

Presenter:

Marios Belk, Department of Computer Science

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We present the work of an internal funded research project of the University of Cyprus (2010-2012), called smarTag. The overarching aim of the project was to study the effect of specific cognitive factors of users on the adaptation of Web environments. In particular, a semantic Web-based adaptation framework has been proposed that enables authors to enrich Web content with semantic mark-ups, which are further processed and reconstructed by an adaptation mechanism based on cognitive characteristics of users. Various user studies have been conducted throughout the project providing interesting insights with respect to the effect of adaptation in terms of user satisfaction while interacting with an adapted (personalized) and a non-adapted (original) version of the same Web environment.

POSTERS

Friday, 16/11/2012**14:15-15:15****Poster Session****P-1: Uranium Concentration in Cypriot Groundwaters***Authors:*

Maria Efstathiou, Ioannis Pashalidis

Presenter:

Maria Efstathiou, Department of Chemistry

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Knowledge of the uranium concentration in ground and surface waters is important in performing radiological impact assessment of various anthropogenic activities and aims to secure the increased standard of life in modern societies. In this context, we have obtained samples from eighty different Cypriot groundwater systems. The uranium concentration and the isotopic ratio $^{238}\text{U}/^{234}\text{U}$ in these samples have been determined by α -spectroscopy after pre-concentration and separation of the element by cation exchange (Chelex-100 resin) and its electrodeposition on stainless steel discs. The uranium concentration in the groundwater samples varies between 0.1 and 40 $\mu\text{g l}^{-1}$ with the highest uranium concentrations observed in groundwaters associated with sedimentary rock formations. In addition, uranium concentration in a groundwater increases with decreasing pH ($7 < \text{pH} < 8$) and this is attributed to the fact that at lower pH dissolution of soil minerals occurs, and uranium, which is adsorbed or forms solid solution with the geological matrix enters the aqueous phase. In all samples the obtained isotopic ratio $^{238}\text{U}/^{234}\text{U}$ varies between 0.95 and 1.2 indicating basically the presence of natural uranium in the studied waters. The calculated annual doses, which correspond to the studied groundwaters even in the extreme cases, are below the guidance level recommended by the World Health Organisation (WHO), which is equivalent to a committed effective dose of 0.1 mSv y^{-1} . However, regarding the chemotoxicity of uranium there were groundwaters with uranium concentration above the (chemotoxic) guidance level recommended by WHO for drinking water (15 $\mu\text{g l}^{-1}$ natural uranium), indicating the need to adopt measures to protect public health and perform further/extensive studies.

P-2: Down-regulation of Survivin by D-alpha-tocopheryl Polyethylene Glycol Succinate (TPGS) Induces Cell Cycle Arrest and Apoptosis Selectively in Breast Cancer Cells*Authors:*

Andreas I. Constantinou, C. Constantinou, Christiana Neophytou, Panos Papageorgis

Presenter:

Christiana Neophytou, Department of Biological Sciences

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The manipulation of differentially regulated apoptotic pathways in normal and tumor cells allows the development of cancer-cell-selective therapies. Survivin, a member of the inhibitor of apoptosis (IAP) protein family, is highly expressed in all primary tumor types but is undetectable in most normal differentiated tissues. Survivin has been implicated in both cell survival and regulation of mitosis in cancer. Here, we identified D-alpha-tocopheryl polyethylene glycol succinate (TPGS), a synthetic derivative of natural vitamin E used in applications of various nanocarriers for drug delivery, as a potent Survivin inhibitor.

P-3: Alternative-Path creation for Congestion Control in Wireless Sensor Networks*Authors:*

Charalambos Sergiou, Vasos Vassiliou

Presenter:

Charalambos Sergiou, Department of Computer Science

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Network Congestion is a highly undesirable situation for every type of network. Especially in low powered Wireless Sensor Networks (WSNs), congestion can be proven critical for the network's proper operation. In case of congestion in a WSN, the network is programmed to react, either by reducing the data rate of the sources or by creating multiple routing paths to the sink, thus avoiding the network's congested point. In this paper we perform a comparison of these two techniques, comparing one algorithm of each category. Results depict the advantages and disadvantages of each category.

P-4: Investigation of the Anti-cancer Effects of KC-53 in Leukemia*Authors:*

Andreas I. Constantinou, Kyriacos C. Nicolaou, Christiana Savva

Presenter:

Christiana Savva, Department of Biological Sciences

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Leukemias are the most commonly diagnosed hematological malignances characterized by abnormal neoplastic proliferation of the cells of the immune system. The antitumor agents used in chemotherapy aim to induce cell death thus limiting the growth and spreading of malignant cells. KC-53, an analogue molecule of the natural product Biyouyanagin-A is known to display anti-HIV-1 activity in relatively low concentrations. Our studies focus on evaluating the effect of KC-53 in different leukemic cell lines with emphasis on anticancer activity and investigate the molecular mechanism of its action.

P-5: Mobile-CC: Congestion Mitigation Using Mobile Nodes in WSNs*Authors:*

Marios Koutroullos, Charalambos Sergiou, Vasos Vassiliou

Presenter:

Marios Koutroullos, Department of Computer Science

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In this work, we describe the notion of using mobile nodes to mitigate congestion under specific circumstances. We examine the benefits of introducing new mobile nodes placed between the congested areas and sinks, in order to provide alternative disjoint paths towards them. The proposed Mobile Congestion Control (Mobile-CC) algorithm is applicable in areas where congestion happens repeatedly, or is of high duration, or even permanent.

P-6: Radium Removal from Aqueous Solutions by Adsorption on Non-Treated and Chemically Modified Biomass By-Product*Authors:*

Ioannis Pashalidis, Melpomeni Prodromou

Presenter:

Melpomeni Prodromou, Department of Chemistry

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The adsorption efficiency of a biomass by-product (olive cake) regarding the removal of radium (Ra-226) from aqueous solutions has been investigated prior and after its chemical treatment. The chemical treatment of the biomass by-product included phosphorylation and MnO_2 -coating. The separation/removal efficiency has been studied as a function of pH, salinity (NaCl) and calcium ion concentration ($[Ca^{2+}]$) in solution. The results of the present study indicate that depending on the physicochemical characteristics of the radium-contaminated water, all three types of the biomass by-product could be effectively used for the treatment of radium-contaminated waters.

P-7: Arginine Methylation: a Novel Regulator of the Tumor Suppressor p53*Authors:*

Antonios Kirmizis, Demetria Pavlou

Presenter:

Demetria Pavlou, Department of Biological Sciences

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p53 tumour suppressor has the capacity to prevent cancer formation by inducing multiple cellular pathways, including cell cycle arrest and cell death. Recently, several post-translational modifications that occur on p53 amino acid residues have been described to modulate the stability of the protein and alter its transcriptional response. In the current study, a novel level of p53 control mediated by arginine methyltransferases at the C-terminal regulatory region is investigated.

P-8: Short-Term Load Prediction Using Functional Time Series Methods: Application to the Electricity Authority of Cyprus System*Authors:*

Maria Frangeskou, Efstathios Pappadimitriou, Theofanis Sapatinas

Presenter:

Maria Frangeskou, Department of Mathematics and Statistics

maria13frang@hotmail.com

We introduce a novel functional time series methodology for short-term load forecasting. The prediction is performed by means of a weighted average of past daily load segments, the shape of which is similar to the expected shape of the load segment to be predicted. The past load segments are identified from the available history of the observed load segments by means of their closeness to a so-called reference load segment, the later being selected in a manner that captures the expected qualitative and quantitative characteristics of the load segment to be predicted. As an illustration, we apply the suggested functional time series forecasting methodology to historical daily load data that were provided by Electricity Authority of Cyprus (EAC) and compare its performance to that of a recently proposed alternative functional time series methodology for short-term load forecasting.

P-9: Mobility Management in WSN using Fuzzy Logic*Authors:*

Chrysostomos Chrysostomou, Vasos Vassiliou, Zinon Zinonos

Presenter:

Zinon Zinonos, Department of Computer Science

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Mobility management in Wireless Sensor Networks is considered to be of an utmost importance for today's critical applications. In this paper, we present a soft mobility management solution where the mobility procedures are supported by fuzzy logic techniques. Our solution was designed and implemented to support the movement of a mobile worker inside an oil refinery area. The results show that the proposed system provides high reliability and control over the handover actions.

P-10: New 3-D Co^{2+} and Ni^{2+} Metal Organic Frameworks With Unique Network Topologies by the Connection With Isonicotinic Acid*Authors:*

Andreas Kourtellaris, Eleni Moushi, Anastasios Tasiopoulos

Presenter:

Andreas Kourtellaris, Department of Chemistry

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Metal Organic Frameworks (MOF's) are essentially coordination polymers formed in the most elementary sense by connecting together metal ions with polytopic organic linkers often resulting in fascinating structural topologies. Pore size and performance depend on the combination of metal and linker, as well as the structure in which they are connected. They have received much attention in recent years especially as newly developed porous materials. As such, they possess a wide array of potential applications including materials for gas storage, gas/vapor separation, catalysis, luminescence, and drug delivery. On this project, it will be described the synthesis, the structure description and the studies of two new 3-D MOF's which were isolated by the combination of Co^{2+} and Ni^{2+} with isonicotinic acid.

P-11: The Evolution of Smart Homes: Towards the WEB*Authors:*

Andreas Kamilaris, Andreas Pitsillides

Presenter:

Andreas Kamilaris, Department of Computer Science

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The Internet of Things and the forthcoming Web of Things, allow household physical devices that live inside smart homes to seamlessly communicate through the Web while smart metering provides energy awareness to home residents. Smart power outlets even permit the control of individual appliances, transforming the energy conservation initiatives inside the smart home into an easy task. We investigate these new technological possibilities, to bring smart homes towards the Web, achieving high interoperability and flexibility. Thus, we present a smart home application that operates using Web principles, integrating Web-enabled sensor devices and smart power outlets towards advanced automation and energy efficiency.

P-12: Identification of Protein Arginine Demethylase(s) Using Synthetic Dosage Lethality (SDL) Screens

Authors:

Antonis Kirmizis, Dimitris Kyriakou

Presenter:

Dimitris Kyriakou, Department of Biological Sciences

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The function of a protein is frequently regulated by post-translational modifications, such as methylation, phosphorylation, acetylation. Arginine methylation is one such modification that is catalysed by a family of enzymes known as Protein Arginine Methyltransferases (PRMTs). However, little is known about the enzymes that can remove this modification from proteins. Therefore, the main objective of this study is to discover protein arginine demethylase(s). To accomplish the above aim we will utilize a recently developed Synthetic Dosage Lethality (SDL) analysis which involves genetic screens that will be performed systematically in a genome-wide scale in yeast.

P-13: Histone N Terminal Acetylation Regulates Gene Expression

Authors:

Antonis Kirmizis, Vassia Schiza

Presenter:

Vassia Schiza, Department of Biological Sciences

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The cellular function of the N-terminal acetylation of proteins is currently unknown. Using *Sacharomyces cerevisiae* as a model, results point towards a new finding; that N-terminal acetylation controls gene expression through regulating internal arginine methylation.

P-14: Study of the Ecology, Genetic Variation and Behaviour of the Freshwater Crab of Cyprus

Authors:

Vasileios Louca, Pantelis Savvidis, Spyros Sfenthourakis

Presenter:

Pantelis Savvidis, Department of Biological Sciences

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In this study we investigate interspecific competition between the protected freshwater crab (*Potamon potamios*) with the introduced freshwater crayfish. Also, we compare a number of environmental variables among the sites where the crab is presence and sites from where it is absent. Finally, we explore the genetic variation of the species among different sites of occurrence in Cyprus, using mtDNA markers. The results provide information useful for the conservation of the species.

P-15: Robust Inference for Count Time Series

Authors:

Konstantinos Fokianos, Roland Fried, Stella Kitromilidou

Presenter:

Stella Kitromilidou, Department of Mathematics and Statistics

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We consider a log-linear Poisson model for count time series under three forms of interventions: an Additive Outlier, a Transient Shift and a Level Shift. We estimate the parameters using the MLE, the Conditionally Unbiased Bounded-Influence estimator and the Mallows Quasi-Likelihood estimator and compare the estimators in terms of their MSE, bias and MAD.

P-16: Qualitative and Quantitative Analysis of COPs in Cypriot Meat Samples using HPLC-Determination of the Most Effective Sample-Preparation Procedures

Authors:

Christiana Georgiou, Constantina P. Kapnisi-Christodoulou

Presenter:

Christiana Georgiou, Department of Chemistry

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The goal of this research is the quantitative and qualitative analysis of cholesterol oxidation products (COPs) in Cypriot meat products by the use of high performance liquid chromatography (HPLC). Different sample pre-treatment methods were compared in order to determine the one that is the most effective, in regard to analyte recovery, time, difficulty and reproducibility.

P-17: Using Timed Input/Output Automata to Implement Distributed Systems*Authors:*

Chrysis Georgiou, Peter M. Musial, Christos Ploutarxou

*Presenter:*Christos Ploutarxou, Department of Computer Science
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Our objective is the derivation of software that is verifiably correct by using abstract system specifications and modeling these in a formal framework called Timed Input/Output Automata (TIOA). The main challenge is the transformation of these abstractions into executable code. We present a set of methods for systems described as a network to TIOA into Java code for distributed platforms. We prove that the presented methods preserve guarantees of the source specifications, and therefore, result in code that is correct by construction.

P-18: The Role of Samba in *Xenopus* Development*Authors:*

Maria Andreou, Paris A. Skourides, Irene C.Y. Yan

*Presenter:*Maria Andreou, Department of Biological Sciences
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Samba is a *Xenopus* hnRNP that is expressed in all developmental stages and the expression appears elevated during neurula stages. Here we examined the protein localization at the cellular and embryonic level and also explore the role of the protein during development with loss of function experiments. The protein is localized in the nucleus, the cytoplasm and the plasma membrane. It is associated with microtubules during mitosis and it is transported in axons. We also show using FRAP and FLIP that Samba shuttles between the cytosol and the nucleus consistent with a role as an hnRNP. Loss of function experiments using antisense Morpholinos leads to defective neural development. In spite of the high homology between 40Love/Samba and hnRNP AB the two proteins localize in distinct manners suggesting distinct functions in the embryo.

P-19: Chiral Amino Acid Ester-based Ionic Liquids: a New Class of Chiral Selectors in Capillary Electrophoresis*Authors:*

Constantina P. Kapnisi-Christodoulou, Ioannis Stavrou

*Presenter:*Ioannis Stavrou, Department of Chemistry
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In this study, the utility of using a chiral ionic liquid (CIL) as the sole chiral selector in capillary electrophoresis was investigated for the first time. In particular, five amino acid ester-based CILs were synthesized and used as additives in the BGE in order to evaluate their chiral recognition ability. The performance of these CILs as the sole chiral selectors was evaluated by using 1,1'-Binaphthyl-2,2-diyldihydrogenphosphate (BNP) as the analyte and by computing and comparing the resolution values. Different parameters were examined, such as the alkyl group bulkiness and the configuration of the cation, the type of the anion of the CIL, its concentration and the pH of the BGE, in order to optimize the separation of the enantiomers and to demonstrate the effect that each parameter has on the chiral recognition ability of the CIL. Baseline separation of BNP within thirteen minutes was achieved by using a BGE of 100 mM Tris/10 mM sodium tetraborate decahydrate (pH=8) and a chiral selector of 60 mM L-alanine tert butyl ester lactate. The run-to-run and batch-to-batch reproducibilities were also evaluated by computing the RSD values of the EOF and the two enantiomer peaks. In both cases, very good reproducibilities were observed, since all RSD values were below 1%.

P-20: Saddlepoint Approximation for INAR(p) Processes*Authors:*

Anthony C. Davison, Konstantinos Fokianos, Xanthi Pedeli

*Presenter:*Xanthi Pedeli, Department of Mathematics and Statistics
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The INAR(p) process has been defined as a discrete counterpart of the standard AR(p) process for continuous time series data. We propose a saddlepoint approximation to the log likelihood of the INAR(p) model. The suggested approach, whilst simple in its application, it performs well even in the tails of the distribution and under complicated INAR models.

Simulation results demonstrate its high accuracy even when maximization of the likelihood function is too hard in practice.

P-21: Future Many-core Architectures: Challenges in Programmability, Performance and Resource Utilization

Authors: Konstantinos Christofi, Andreas Diavastos, Panayiotis Petrides, Giannos Stylianou, Pedro Trancoso

Presenter: Andreas Diavastos, Department of Computer Science
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The continuous advances on processor design results in the integration of more and more cores on the same chip. These new architectures of 10s and 100s of cores, also known as many-core architectures, can offer significant performance and power benefits. To harvest these potential benefits we need to address the challenges accompanied of selecting an efficient and easy to adopt programming model, using techniques that will increase the performance and use a scheduling policy that will efficiently utilize the system in both aspects of performance and power consumption.

P-22: Activation of Endogenous FAK via Expression of its Amino Terminal Domain in Xenopus Embryos

Authors: Neophytos Christodoulou, Nicoletta Petridou, Paris A. Skourides, Panayiota Stylianou

Presenter: Nicoletta Petridou, Department of Biological Sciences
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The Focal Adhesion Kinase is a well studied tyrosine kinase involved in a wide number of cellular processes including cell adhesion and migration and it has also been shown to play important roles during embryonic development. Here we examined the pattern of phosphorylation of FAK during Xenopus development and found that FAK is phosphorylated on all major tyrosine residues examined from early blastula stages well before any morphogenetic movements take place. We go on to show that FRNK fails to act as a dominant negative in the context of the early embryo and that the FERM domain has a major role in determining FAK's localization at the plasma membrane. Finally, we show that autonomous expression of the FERM domain leads to the activation of endogenous FAK in a tyrosine 397 dependent fashion.

P-23: The Anomalous Quantum Hall Effect in Graphene

Authors: Konstantinos Mouloupoulos, Anastasia Solea

Presenter: Anastasia Solea, Department of Physics
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In ordinary two-dimensional materials it is possible to observe (at very low temperatures and very strong magnetic fields) the Integer Quantum Hall Effect (IQHE) - the quantization of the Hall conductivity in integer multiples of the quantity ge^2/h . The IQHE is extremely robust due to its connection to topologically invariant quantities and is thus used in metrology (redefinition of SI). Its 'Anomalous version' in the recently isolated material Graphene gives an even more accurate quantization and can be even observed at room temperature!

P-24: SmartP2P: A Multiobjective Framework for Finding Social Content in P2P Smartphone Networks

Authors: Christos Aplitsiotis, Demetrios Zeinalipour-Yazti, Andreas Konstantinidis

Presenter: Christos Aplishiotis, Department of Computer Science
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We present a novel framework for searching objects (e.g., images, videos, etc.) captured by the users in a mobile social community. Our framework, is founded on an in-situ data storage model, where captured objects remain local on their owners smartphones and searches then take place over a novel lookup structure we compute dynamically. Initially, a query user invokes a search to find an object of interest. Our structure concurrently optimizes several conflicting objectives (i.e., it minimizes energy consumption, minimizes search delay and maximizes query recall), using a Multi-Objective Optimization approach and calculates a diverse set of high quality non-dominated Query Routing Trees (QRTs), in a single run. The optimal set is then forwarded to the query user (decision maker) to select a particular QRT to be searched based on instant requirements and preferences.

P-25: Novel Catalytic Systems for Hydrogen Production via the Water-Gas Shift Reaction

Authors:

Angelos M. Efstathiou, Klito Petalidou, Kyriaki Polychronopoulou

Presenter:

Klito Petalidou, Department of Chemistry

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The Water-Gas Shift reaction ($CO + H_2O \rightleftharpoons CO_2 + H_2$, $\Delta H^0 = -41 kJ/mol$) is an important part of the reaction network for hydrogen production through steam reforming of hydrocarbons, sugar, alcohols and bio-oil. It can be used to produce H_2 and reduce the level of CO in the hydrogen product stream to less than 10 ppm, thus ideal to be used in fuel cells for electricity production. The present industrial catalysts used for WGS reaction (Fe_3O_4/Cr_2O_3 and $Cu/ZnO/Al_2O_3$) present several drawbacks, such as pyrophoricity and deactivation if exposed to air and condensed water. This study concerns the synthesis and characterization of novel catalytic systems and their evaluation towards the WGS reaction, in particular supported platinum catalysts ($Pt/Ce_{1-x}La_xO_{2-\delta}$, $Pt/Ce_{1-x}Ti_xO_{2-\delta}$, $Pt/Ce_{1-x}La_xO_{2-\delta}/CNT$ and $Fe/Ce_{1-x}La_xO_{2-\delta}$ (where, CNT: Carbon Nano-Tubes, $x = 0.0, 0.2, 0.5, 0.8$ and 1.0). A detailed physicochemical characterization of catalysts using the techniques: BET, *in-situ* XRD, *in-situ* Raman, SEM, HRTEM, *in-situ* UV-vis/DRS, XPS, TPD-NH₃, TPD-CO₂, H₂-TPR and TPD-H₂ to correlating the physicochemical properties of catalysts with their catalytic activity (CO conversion, X_{CO} , %) will be presented. Transient isotopic experiments (SSITKA-MS-DRIFTS) were used to determine the concentration and chemical structure of *active* reaction intermediate species in WGS, in an effort to better understand the mechanism of the WGS reaction and improve catalyst performance.

P-26: Energy-hole Prevention in Wireless Sensor Networks

Authors:

Charalambos Sergiou, Vasos Vassiliou

Presenter:

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In this paper, we present how the HTAP (Hierarchical Tree Alternative Path) algorithm can drastically assist in the uniform energy utilization of a wireless sensor network and the avoidance of energy holes. HTAP is an algorithm designed explicitly for congestion control and avoidance and its operation is based on the creation of alternative paths from the source to sink, using the plethora of network's unused nodes. The creation of alternative paths involves several nodes which are not in the initial shortest path from the source to the sink and assists in safely transmitting the observed data. The use of these nodes leads to a balanced energy consumption, avoiding the creation of "holes" in the network.

Saturday, 17/11/2012**14:15-15:15****Poster Session****P-27: Synthesis and Characterization of New Heterometallic $Mn^{n+}/4f$ Compounds With 1,3 propanediol as a Ligand***Authors:*

Constantina Papatriantafyllopoulou, Maria Savva, Anastasios Tasiopoulos

Presenter:

Maria Savva, Department of Chemistry

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Single-molecule magnets (SMMs) are individual molecules that function as single domain nanoscale magnetic materials, and thus represent a molecular approach to nanomagnetism. The magnetic behavior of SMMs results from the combination of a large ground-state spin (S) and a large magnetoanisotropy of the Ising (easy-axis) type, as measured by the axial zero-field splitting parameter D. SMMs have been proposed for important technological applications, including high density information storage and they also represent excellent systems for the study of quantum phenomena. A great number of SMMs have been discovered to date, the majority of them being Mn clusters containing at least some Mn^{III} centers.

The development of new synthetic procedures to new high spin molecules is of continuing importance in order not only to discover new SMMs but also for a better understanding of these species. One of the most successful synthetic approaches involves the use of chelates containing alcohol groups, since alkoxides are good bridging groups and thus favour the formation of polynuclear products. In addition, one alternative strategy to new SMMs is mixed transition metal/lanthanide (Ln) chemistry, taking advantage of the large spin and the large anisotropy that Ln ions can provide. This work describes the syntheses, crystal structures and magnetic characterization of new $Mn_2^{III}Ln_2^{III}$ (Ln = Gd, Dy, Ho) species containing 1,3-propanediol as a ligand.

P-28: Explorations in Reinforcement Learning*Authors:*

Chris Christodoulou, Aristodemos Cleanthos, Ioannis Lambrou, Vassilis Vassiliades

Presenter:

Vassilis Vassiliades, Department of Computer Science

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The research area of reinforcement learning (RL) aims to build autonomous agents that are capable of learning effective behaviours for challenging sequential decision making tasks. In this work, we explore various aspects of the problem, such as (i) how to increase the performance of agents in single- and multi-agent environments through hierarchical decomposition of the task into reusable subtasks, and (ii) how to accelerate learning in game theoretic situations by transforming the payoffs into rewards that motivate the agents to achieve their goal. We additionally present a proof of concept for designing arbitrarily complex RL rules.

P-29: Patterns of Phenotypic Variation and Range Overlap in African Savanna Tinkerbirds*Authors:*

Louis Hadjioannou, Alexander N. G. Kirschel

Presenter:

Louis Hadjioannou, Department of Biological Sciences

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My study looks into reassessing the classic patterns of the theories on character displacement and their significance in species range limits and interactions, community ecology and phenotypic evolution. I combine acoustic data, taken in situ, with spectrophotometric and morphometric data, taken from museum specimens, to examine patterns of phenotypic variation in *Pogoniulus* Tinkerbirds. Preliminary results will be presented discussing the patterns and the role they may play in the extent of range overlap and their importance in speciation and evolutionary diversification.

P-30: Understanding the Neural Code through Exploration of the Causes of Firing*Authors:*

Guido Bugmann, Chris Christodoulou, Jacob Kanev, Achilleas Koutsou

Presenter:

Achilleas Koutsou, Department of Computer Science

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We present a method of estimating the input synchrony and by extension determining the operational mode of two variants

of the leaky integrate-and-fire (LIF) neuron. The degree of pre-synaptic synchrony is related to the operational mode of the neuron, which can lie anywhere on a continuum between temporal integration and coincidence detection. The operational mode is in turn related to the way the neuron encodes information into spike trains, which is usually considered to be based either on a rate or on a temporal coding scheme. Our method is based on the slope of the membrane potential during a small period prior to firing and is successfully validated by driving the neuron with predefined levels of synchrony.

P-31: Novel Roles for Trophoblast Signaling After Gastrulation Initiation: Investigation of Ets2 Mutant Mice

Authors:

Pantelis Georgiades, Christiana Polydorou

Presenter:

Christiana Polydorou, Department of Biological Sciences
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Recent work in mice has established that during mammalian development the early trophoblast functions are necessary not only for the establishment of the placenta but also for the patterning of the epiblast. Here, using the ets2-null type II phenotype mice, we show that Ets2-mediated trophoblast signaling is required for several fundamental gastrulation processes after primitive streak initiation.

P-32: SmartTrace

Authors:

Maria Andreou, Constantinos Costa, Dimitrios Gunopulos, Christos Laoudias, Michalis Vlachos,
Demetrios Zeinalipour-Yazti

Presenter:

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We will present a powerful distributed framework for finding similar trajectories in a smartphone network, without disclosing the traces of participating users. Our framework, coined SmartTrace, exploits opportunistic and participatory sensing in order to quickly answer queries of the form: "Report the users that move more similar to Q , where Q is some query trace." SmartTrace, relies on an in-situ data storage model, where geo-location data is recorded locally on smartphones for both performance and data-disclosure reasons. SmartTrace then deploys an efficient top-K query processing algorithm that exploits distributed trajectory similarity measures, resilient to spatial and temporal noise, in order to derive the most relevant answers to Q quickly and efficiently. We assess our ideas with realistic and real workloads from Microsoft Research Asia and other sources. Our study reveals that SmartTrace computes the desired results with 74% less energy consumption and 13% faster than its centralized and decentralized counterparts. Our experimental results also confirm our analytical study.

P-33: New Phenotypic Aspects of the Decidual Spiral Artery Wall During Early Post-implantation Mouse Pregnancy

Authors:

Artemis Elia, Pantelis Georgiades

Presenter:

Artemis Elia, Department of Biological Sciences
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During pregnancy the walls of decidual spiral arteries (SAs) undergo clinically important structural modifications crucial for embryo survival/growth and maternal health. However, the mechanisms of SA remodeling (SAR) are poorly understood. Although an important prerequisite to this understanding is knowledge about the phenotype of SA muscular wall prior to and during the beginning of mouse SAR, this remains largely unexplored and was the main aim of this work.

P-34: Combined Effects of Compressibility and Slip in Flows of a Herschel-Bulkley Fluid

Authors:

Georgios Georgiou, Yiolanda Damianou

Presenter:

Yiolanda Damianou, Department of Mathematics and Statistics
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The combined effects of compressibility and slip in Poiseuille flows of Herschel-Bulkley fluids is investigated. The density is assumed to obey a linear equation of state, and wall slip is assumed to follow Navier's slip condition. The flow is

considered to be weakly compressible so that the transverse velocity component is zero and the pressure is a function of the axial coordinate. Approximate semi-analytical solutions of the steady, creeping, plane and axisymmetric Poiseuille flows are derived and the effects of compressibility, slip, and the Bingham number are investigated.

P-35: Well-defined Copolymers by Controlled Polymerization Methods

Authors:

Demetris Apostolides, Marios Elladiou, Elena Kepola, Elina Kitiri

Presenter:

Demetris Apostolides, Department of Chemistry
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The discovery of living anionic polymerization in the 1950's played an important role in the development of polymer science, since this method of polymerization made possible the synthesis of polymers in which all molecules have the same molecular weight and composition, similar to proteins. Furthermore, this method allowed the facile synthesis of block copolymers, which are copolymers composed of two different homopolymers linked at one end in the molecule, and representing giant surfactants. During the last two decades, new controlled polymerization methods were developed, allowing the preparation of block copolymers based on new monomer repeating units. This poster presents the current work of our team in the synthesis and characterization of various kinds of block copolymers.

P-36: New Insights for Ets2 Function in Trophoblast using Lentivirus-Mediated Gene Knockdown in Trophoblast Stem Cells

Authors:

Pantelis Georgiades, Christoforos Odiatis

Presenter:

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Mouse trophoblast stem (TS) cells represent a unique in vitro system that provides an unlimited supply of TS cells for the study of trophoblast differentiation and TS cell self-renewal. Although the mouse transcription factor Ets2 is required for TS cell self-renewal, its role in this and in TS cell differentiation has not been explored fully, partly due to the early lethality of Ets2 null mice. To address this, we developed a novel lentivirus-based system that resulted in efficient Ets2 knockdown in the overwhelming majority of TS cells.

P-37: Gauge Structures and Topological Aspects in Recently Discovered Exotic Materials: Unifying Principles Relating High-Energy and Condensed Matter Physics

Authors:

Gewrgios Kwnstantinou, Konstantinos Mouloupoulos

Presenter:

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Graphene, a newly discovered exotic material, is a monolayer graphite in which electrons behave as being effectively massless Dirac Fermions with Fermi velocities about 300 times lower than light velocity. This exotic behaviour leads to the appearance of extraordinary stable quantum measurable quantities such as Hall conductivity or dissipationless electric current at room temperature. We report here the topological aspects which give rise to these new phenomena in conventional and unconventional semiconducting materials.

P-38: Minersoft: Software Retrieval in Grid and Cloud Computing Infrastructures

Authors:

Marios D. Dikaiakos, Paris Iona, Asterios Katsifodimos, George Pallis

Presenter:

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One of the main goals of Cloud and Grid infrastructures is to make their services easily accessible and attractive to end-users. In this demo, we present Minersoft, a harvester that visits Grid/Cloud infrastructures, crawls their file systems, identifies and classifies software files, and discovers implicit associations between them. The results of Minersoft harvesting are encoded in a weighted, typed graph, called the Software Graph. A number of information retrieval (IR) algorithms are used to enrich this graph with structural and content associations, to annotate software files with keywords and build inverted

indexes to support keyword-based searching for software. Experimental results have shown that Minersoft is a powerful tool for software search and discovery.

P-39: 5-AZA/TSA Reverses Tamoxifen Induced Changes in Chromatin Remodeling Enzymes in MCF-7/TAM-R Cells

Authors:

Andreas I. Constantinou, Panos Papageorgis, Chara Pitta

Presenter:

Chara Pitta, Department of Biological Sciences

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A number of breast cancers are either resistant or develop resistance to tamoxifen and other SERMs. The promoters of ER- α and ER- β are rich in CpG islands making them susceptible to epigenetic modifications. Methylated CpG clusters are known to be associated with gene silencing. The objective of this study is that tamoxifen resistant breast cancer cells can be sensitized to tamoxifen after treatment with either a demethylating agent (such as 5-AZA) or a histone deacetylase inhibitor (such as trichostatin, TSA) or their combination. Our results show: (a) the reversal of tamoxifen resistance can be achieved with relatively low (non-toxic) concentrations of 5-AZA/TSA, and (b) the upregulation of ER- β , p53 and p21 are essential components of the molecular pathway leading to this reversal.

P-40: Grid and Cloud Computing Infrastructures

Authors:

Andoena Balla, Marios D. Dikaiakos, Nicholas Loulloudes, Maria Poveda

Presenter:

Andoena Balla, Department of Computer Science

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A number of large-scale Grid and Cloud infrastructure is currently in operation around the world, federating an impressive collection of computational resources and a wide variety of application software. To establish a contact point for local scientific community users who are interested in Grid computing, the Laboratory for Internet Computing (former HPCL) initiated CyGrid at the University of Cyprus during the year 2001-2002. To assist in the enhancement of the local infrastructure and enable researchers to safely use the Grid, CyGrid has established two Resource Centers (with a computational power of 130 CPUs, and storage capacity of 75TB), hosted in the University of Cyprus and in the University of Nicosia (former Intercollege). Both resource centers are connected to the European Grid Infrastructure (EGI).

P-41: Factors Influencing the Pro-oxidant and Cytotoxic Activities of the Olive Polyphenols Oleuropein and Hydroxytyrosol

Authors:

Andreas I. Constantinou, Elena Odiatou, Alexis Leandros Skaltsounis

Presenter:

Elena Odiatou, Department of Biological Sciences

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In this study we have identified the precise conditions that promote free radical production by the main olive polyphenols oleuropein and hydroxytyrosol in culture media and examined the susceptibility of normal and cancer cells to the cytotoxic effects of the free radicals produced in this manner. Our results can find immediate applications in the interpretation of in vitro data with H₂O₂ generating plant polyphenols.

P-42: Putting a "Separation Tag" on Trivalent Lanthanide Ions Using Neutral Lipid Monolayers and Bilayers

Authors:

Damien Bourgeois, Thomas Delclos, Olivier Diat, Marie-Claire Dul, Epameinondas Leontidis, Daniel Meyer, Thomas Zemb

Presenter:

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A major challenge faced by the nuclear industry is the recycling of spent fuel. The goal of the 4th generation reactors is to recycle fuel efficiently, leaving behind waste with low toxicity. This can be achieved only through extensive recycling, which is a difficult process, since spent fuel contains useful actinides, but also lanthanides and other metal cations that are very difficult to separate from the fuel. The separation from the solution involves classical liquid-liquid extraction steps; these

are empirically designed and use non-specific ligands that bind lanthanide and actinide ions, as well as tetravalent ions, and do not extract mono- and divalent ions. Softer interactions are significant in these processes and are poorly understood: the transfer of ions between the extraction phases cannot be represented by molecular equilibria.

It has been shown that lipid monolayers can be used to quantitate the affinity of anions for soft matter interfaces, and to assign an interfacial affinity index for each ion. In this work we focus on trivalent lanthanide cations. The method used is based on measurement of surface pressure/molecular area isotherms of lipids in the presence of various concentrations of lanthanide salts (with a Langmuir film balance). The choice of lipids used in this study must rule out strong interactions leading to strong complexation. Therefore we cannot use phospholipids or fatty acids. We have opted to use malonamide and sulfobetaine derivatives with two hydrophobic tails that form more stable Langmuir monolayers. Furthermore, the isotherms of these compounds must be measurably perturbed by lanthanides, preferably in a cation-specific way. In this preliminary study we have screened various parameters such as the ion type and concentration, temperature and pH. The next steps of this project are to use other techniques to obtain complementary thermodynamical data on selected systems. The equipment that will be used for this purpose include PM-IRRAS spectroscopy, ITC, and SPR measurement.

P-43: Anti-cancer Effects of 6-bromoindirubin-3'-oxime and 7-bromoindirubin-3'-oxime on Breast, Prostate and Osteosarcoma Cancer Cells

Authors: Andreas I. Constantinou, Andreas Evdokiou, Vasilis Liapis, Katerina Nicolaou

Presenter: Katerina Nicolaou, Department of Biological Sciences
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The objective of the present study was to evaluate and compare the anti-cancer properties of two novel bromo-substituted derivatives 6-bromoindirubin-3'-oxime (6BIO) and 7-bromoindirubin-3'-oxime (7BIO). Our results show that, (1) both compounds induce apoptotic effects through different molecular pathways, and (2) 6BIO only exhibit anti-metastatic and anti-invasive properties. These differences in the mechanism of action between the two derivatives may prove useful in combination chemotherapy protocols for the treatment of cancer.

P-44: Prediction for Negative Binomial Time Series Models

Authors: Vasiliki Christou, Konstantinos Fokianos

Presenter: Vasiliki Christou, Department of Mathematics and Statistics
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During recent years there has been considerable interest in models for time series of counts because they appear in several diverse scientific fields, including medical, environmental or financial applications. Therefore, we consider the development of statistical methodology for count time series modeling, estimation, inference and prediction. We provide forecasts based on the assumption of Negative Binomial or Poisson distribution and we propose the use of PIT histogram, marginal calibration plot and scoring rules to assess the predictive performance and rank the competing forecast models.

P-45: The Airplace Indoor Positioning Platform for Android Smartphones

Authors: Marios Constantinides, George Constantinou, Christos Laoudias, Silouanos Nicolaou, Christos G. Panayiotou, Demetrios Zeinalipour-Yatzi

Presenter: George Larkou, Department of Computer Science
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AirPlace is an indoor positioning system developed for Android smartphones. To infer the unknown user location we rely on ubiquitous WLANs and exploit Received Signal Strength (RSS) values from neighboring Access Points (AP) that are constantly monitored by the mobile devices under normal operation. In a typical scenario, when a user walks inside a building a smartphone client conducts a single communication with our Distribution Server to receive the RSS radiomap and is then able to position itself independently using the observed RSS values.

P-46: SmartLab

Authors: Constantinos Costa, Andreas Konstantinidis, George Larkou, Demetrios Zeinalipour-Yazti
Presenter: George Larkou, Department of Computer Science
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We will present an exciting experimental testbed of approximately 40+ real Android Smartphones plus numerous emulated devices, deployed at the Department of Computer Science building at the University of Cyprus. SmartLab provides a public, permanent testbed for development and testing of smartphone network applications via an intuitive web-based interface. Registered users can upload and install Android executables (APKs) on a number of Android smartphones, capture their output, reboot the devices, create concurrent interactive jobs using MonkeyRunner scripts, interact with the remote devices and many other exciting features. SmartLab aims to facilitate research in smartphone network programming environments, communication protocols, system design, and applications.

P-47: Spectroscopic Characterization of Substituted Thiadiazines

Authors: Sophia C. Hayes, Heraklidia A. Ioannidou, Theodosia A. Ioannou, Panagiotis A. Koutentis, Eleni Theodorou
Presenter: Eleni Theodorou, Department of Chemistry
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Heteroarenes have been successfully incorporated in π -conjugated oligomers and polymers and a variety have found use as the active layer in optoelectronic devices. Heteroarenes with a larger proportion of sulfur and nitrogen atoms have been extensively exploited in optoelectronics for their electron-accepting ability. In this study a range of spectroscopic techniques (Resonance Raman spectroscopy, Absorption (UV/vis) and Photoluminescence (PL)) have been applied for the characterization of thiadiazines, which belong to a new class of heteroarene molecules. These molecules are electron acceptors, and are studied their possible integration in donor-acceptor systems for application mainly in photovoltaic devices. The experimental results have been combined with theoretical calculations of their orbitals and vibrational frequencies for a more complete understanding of the optical properties, on the basis of molecular geometry and electron distribution.

P-48: Stopping Times in Cessation Flows of Bingham Plastics With Slip at the Wall

Authors: Georgios Georgiou, Maria Philippou
Presenter: Maria Philippou, Department of Mathematics and Statistics
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The main objective of my presentation is to examine numerically the cessation of axisymmetric Poiseuille flow of a Bingham plastic assuming that slip occurs along the wall. A power-law expression is used to relate the wall shear stress to the slip velocity. The numerical results show that the velocity becomes and remains uniform before complete cessation and that the stopping time is finite only when the exponent $s < 1$. In the case of Navier slip ($s = 1$), the stopping time is infinite for any non-zero Bingham number and the volumetric flow rate decays exponentially. When $s > 1$, the decay is much slower, i.e. polynomial.

P-49: Investigation of Benzo[1,2,4]Triazinones as Possible Amyloid Inhibitors of TTR (105-115) using UV Resonance Raman Spectroscopy

Authors: Andrey Berezin, Nikos Christofi, Sophia C. Hayes, Panagiotis A. Koutentis
Presenter: Nikos Christofi, Department of Chemistry
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The current study uses UV Resonance Raman for investigating the structural changes of the TTR (105-115) peptide at the presence or absence of a new class of candidate inhibitors from the series of benzo[1,2,4]triazinones. In particular, this 11-residue peptide, which corresponds to a naturally-occurring β -strand in the crystal structure of the human amyloid protein transthyretin, has been shown to assemble into very well organized amyloid fibrils *in vitro*. Transmission Electron Microscopy (TEM) was used to verify whether we had formation of amyloid fibrils. Most interesting is the fact that at the presence of some benzotriazinones analogues the fibrillation process was delayed and that further small structural alteration

of their structure might lead to the total inhibition of the fibrillation process. Additionally, the structural similarities of benzotriazinones with Thioflavin-T (used in fluorescence spectroscopy for tagging and observing the fluorescence emission during the fibrillation process) lead us to use benzotriazinones in analogous experiments. The results were very encouraging as the fluorescence emission band showed an increase and a blue shift in λ max within the time frame that aggregation of the peptide was observed, which was delayed as shown in the RR experiments.

P-50: MicroRNAs are Potential Regulators of Gene Transcription by Their Direct Binding on Intergenic DNA Target Sequences in Human Cells: the hsa-miR-548c-5p Example

Authors: Andrea Christofides, Gregory Papagregoriou, Harsh Dweep, Norbert Gretz, Kyriacos Felekis, Constantinos Deltas

Presenter:

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We aim at investigating the function of miR-548c-5p, a small non-coding RNA molecule, on the translational repression/enhancement of genes by its direct hybridization on intergenic DNA target sequences. For this purpose, we use bioinformatics for predicting miRNA-DNA target sites and luciferase reporter constructs in cell cultures for verifying their functional properties. In addition, such sites are immunoprecipitated together with microRNA-associated proteins.

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