

research newsletter



Eastern Mediterranean University

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Dear Colleagues,

In the third issue of *EMU Research Newsletter* for 2007, we continue to feature articles that cover a wide range of exciting research activities: Mustafa Rıza details a modeling project that aims to provide a better understanding of the quantum mechanical principles of scanning tunneling microscopy with significant implications on nanoscience and nanotechnology; Özlem Olgaç Türker and Hıfısiye Pulhan describe a collaborative study on continuity of rural vernacular environments in Cyprus, an issue that deserves special attention amidst the ongoing construction frenzy in the north of the island; and finally, Süleyman Aşır outlines his research on synthesis of chemicals that can act as building blocks for future optical devices.

With best regards,

Dizem Arifler

Editorial Pointer: NATO Science for Peace and Security Programme (NATO-SPS)



A two-day meeting titled "NATO Info Day and Building Partnership" was organized by TÜBİTAK (The Scientific and Technical Research Council of Turkey) in Ankara, Turkey on November 8-9, 2007. The aim was to draw the attention of researchers towards the NATO Science for Peace and Security Programme (NATO-SPS). Officers from NATO Public Diplomacy Division introduced the audience to the general outline of the programme. NATO SPS Turkish Panel members and co-directors of scientific projects shared their experiences. Elvan Yılmaz, the director of the Institute of Graduate Studies and Research, attended the meeting as the representative of EMU.

The SPS programme was initiated to sponsor cooperation between scientists on security-related issues in civil science, environment and technology. The key priority areas associated with NATO's objectives have been chosen as *defense against terrorism*, *countering other threats to security*, and *partner country priorities*. For example, *defense against terrorism* would include topics like 'detection of chemical, biological, radiological or nuclear weapons or agents/methods to protect against efforts by terrorists to destroy the environment or vital computerized infrastructure' as outlined in *Guide to the NATO Science for Peace and Security Programme*. One example to the topics covered by *countering other threats to security* theme is 'technical, economic and social factors underlying the management of vital resources, such as food and energy'.

Experts who are affiliated with academic or industrial organizations and who are residents in a NATO, Partner or Mediterranean Dialogue country with mailing addresses and contact details in that country are eligible for funding. Applications are peer-reviewed by Advisory Panels in four main areas: Chemistry/Physics/Biology (CPB) Panel, Environmental Security (ES) Panel, Information and Communications Security (ICS) Panel, and Human and Societal Dynamics (HSD) Panel. Application deadlines are the first day of March, July and November. Some examples to the topics covered by these panels are new detection methods for chemical, biological and radiological agents, the effects of these agents on human health and environment, development of new vaccines, food security, environmental security along cross-border waterways, cryptology, information systems security, network security, cyberdefense, and biometric recognition, just to mention a few. In HSD panel, multidisciplinary projects that enhance synergy between natural and social sciences and/or humanities are encouraged. More information on the SPS Programme, application details and application forms, contact details, lists of NATO, Partner and Mediterranean Dialogue countries can be accessed at www.nato.int/science.

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■ News Highlights ■

■ Spring 2007 EMU Type-A project award recipients announced

In Spring 2007, EMU approved financial support for fifteen Type-A research projects. Below is a list of the principal investigators whose projects were approved, the project titles in English or Turkish as originally proposed by the investigators, and the total amount of funding for each project:

■ Gürcü Öz Akıncı (Computer Engineering)

Project Title: Performance Evaluation of an Efficient Reconfigurable Routing for Multicasting Data Delivery in Ad Hoc Networks
Amount: 10,000 USD

■ Sevda Alankuş (Radio, Television and Film)

Project Title: Kıbrıslı Türk Toplumunun “Eksik” Tarihini Tamamlamak: Kuzey Kıbrıs’tan Kadın Anlatılarıyla, Portreleri
Amount: 7,250 USD

■ Mehmet Altınay (Tourism and Hospitality Management)

Project Title: Üniversite Öğrencilerinde Sağlık Yönünden Riskli Yaşam Koşullarının Araştırılması
Amount: 13,280 USD

■ Resmiye A. Atun (Interior Architecture)

Project Title: Assessing the Impact of Nicosia Master Plan in the Historic Walled City: Policy Implications for the Sustainable Development of the Area
Amount: 11,254 USD

■ Huriye Bilsel (Civil Engineering)

Project Title: Characterization of Polymer Enhanced Compacted Sand-Bentonite as Waste Containment Barrier for Landfills and Mine Waste in a Semi-Arid Climate
Amount: 17,926 USD

■ Manuel Carcenac (Computer Engineering)

Project Title: Using a Novel Neural Network for Weather Forecasting
Amount: 6,164 USD

■ Mürüde Çelikağ (Civil Engineering)

Project Title: Behaviour of Reduced Steel Beam Web (RBW) Connection
Amount: 16,784 USD

■ Özgür Eren (Civil Engineering)

Project Title: Determination of Strength-Age-Permeability Characteristics for Existing Reinforced Concrete Structures
Amount: 15,827 USD

■ Mehmet M. Erginel (English Literature and Humanities)

Project Title: Plato on Pleasure and Happiness
Amount: 4,425 USD

■ Mehmet M. Kunt (Civil Engineering)

Project Title: Yol Yönetim Sisteminin Coğrafi Bilgi Sistemi Ortamında Geliştirilmesi
Amount: 24,919 USD

■ Adham A. Mackieh (Industrial Engineering)

Project Title: An Empirical Investigation of the Work-Related Musculoskeletal Disorders During Computer Use and Finding Ways to Prevent Them
Amount: 13,000 USD

■ İbrahim Numan (Architecture)

Project Title: Karpaz Sahillerine Yuva Yapan Deniz Kaplumbağalarının Korunması ve İzlenmesi Projesi
Amount: 15,755 USD

■ Mustafa Rıza (Mathematics)

Project Title: Quantum Mechanical Tunneling in 3D with Applications to STM
Amount: 11,877 USD

■ Filiz Sarıoğlu (Mechanical Engineering)

Project Title: Investigation of Formability of Aluminum Alloy Sheets by Erichsen
Amount: 29,016 USD

■ Michael Walsh (Archaeology and Art History)

Project Title: Medieval Famagusta: Restoration, Conservation and Stabilization
Amount: 2,990 USD

■ Recent conferences organized at EMU

The Cyprus Conflict: Looking Ahead – Cyprus Policy Center (CPC) at EMU organized a conference titled “The Cyprus Conflict: Looking Ahead” with participation of academicians, professionals and experts from different countries. The event took place in Famagusta, Cyprus on May 7-8, 2007. The keynote speech was delivered by Lord David Hannay. At the

end of Fall 2007, CPC will publish the conference proceedings in a book which will be edited by Ahmet Sözen, the director of CPC.



Lord David Hannay

SIN 2007 – The International Conference on Security in Information and Networks (*SIN 2007*) took place on May 7-11, 2007. The conference was organized jointly by the Faculty of Engineering of Eastern Mediterranean University and the Faculty of Electrical and Electronics Engineering of Istanbul Technical University. *SIN 2007* covered a wide range of topics on information and network security including cryptology and IT governance. Among the invited speakers were Elisabeth Oswald (University of Bristol, Bristol, UK), Marc Joye (Thomson R&D, France), Çetin K. Koç (Istanbul Commerce University, Turkey and Oregon State University, USA), Karthik Bhargawan (Microsoft Research Cambridge, UK), Bart Preneel (Katholieke Universiteit Leuven, Leuven, Belgium), and Mehmet U. Çağlayan (Boğaziçi University, Turkey). The conference was supported by IEEE Turkey Section, IEEE Computer Society Turkey Branch, Microsoft Research and Microsoft Turkey, National Research Institute of Electronics and Cryptology (UEKAE), TRNC Chamber of Computer Engineers, and KKTCell.

■ Recent publications by EMU Press



The 32nd issue of *Journal of Cyprus Studies*, *JCS 32*, which was edited by Özlem Çaykent, includes the following article and supporting material:

- J. Asmussen, “Terrorism in Cyprus – the Grivas Diaries”
- Secretary of State for the Colonies, “Terrorism in Cyprus: The Captured Documents, 1956” (Preface, Part I: *Diary of George Grivas*, Part II: *The Captured Documents*, Appendix I: *Cyprus: Some Facts*,

Appendix II: *Code Names and Identification of the Leading Terrorists*, Appendix III: *Biographical Notes on Some of the Terrorists Mentioned in the Text*, Appendix IV: *Details of Terrorist Atrocities*, Appendix V: *Why was Archbishop Makarios Deported?*)

Journal of Cyprus Studies is a refereed, international, and interdisciplinary publication, published twice a year by EMU Press for the Center for Cyprus Studies. The primary purpose of the journal is twofold: i) to develop an authoritative archive and bibliography of sources for the study of ideas on social, cultural, historical, political and legal matters relevant to the past, present, or future of the island of Cyprus, and ii) to provide a scholarly/academic forum for the analysis, development, exchange and critique of ideas on these matters. The journal is bilingual, publishing material in English and/or Turkish, and is indexed in the following databases: CSA Sociological Abstracts, Social Services Abstracts, Linguistics and Language Behavior Abstracts, ASSIA, Worldwide Political Science Abstracts, InfoTrac Custom, InfoTrac OneFile, Expanded Academic Index, History RC: Modern World, International Political Science Abstracts, and ABC-Clio Historical Abstracts. Contributions can be sent to jcs@emu.edu.tr.

Proceedings of the 5th International Congress on Cyprus Studies (Volume I and II), edited by Ülker Vancı Osam, includes a total of 34 papers (12 in English and 22 in Turkish). Volume I consists of 20 papers related to political issues, economy, history, art, literature and education, whereas Volume II encompasses 14 papers on architecture, archeology and environment, folklore, and sociological matters.

■ Books or book chapters by EMU researchers

The following is a list of recent books and book chapters written or edited by EMU researchers. The list provided here may not be comprehensive as it has been put together based on e-mails sent to the newsletter staff before September 15, 2007.

- M. Annaorazov, “Magnetocaloric cooling with Heusler alloys and related materials,” in *Double Exchange in Heusler Alloys and Related Materials 2007*, K. Baerner, Ed., pp. 115-124, Research Signpost, Trivandrum, Kerala, India (2007).
- G. İnanç, *Büyükelçiler Anlatıyor: Türk Diplomasisinde Kıbrıs (1970-1991)*, İş Bankası Kültür Yayınları, İstanbul (2007).

Quantum mechanical tunneling in three dimensions with applications to scanning tunneling microscopy

By Mustafa Riza

The invention of the Scanning Tunneling Microscope (STM) by Binnig, Rohrer, Gerber, and Weibel [1] has ushered in the era of nanoscience. In 1986, just three years after the invention of STM, Gerd Binnig and Heinrich Rohrer were awarded the Nobel Prize in Physics [2]. Shortly after the invention of STM, many more analysis techniques at atomic scale have been invented. These include the Atomic Force Microscope, Magnetic Force Microscope, and Scanning Near-Field Optical Microscope, but STM remains one of the most common surface analysis tools in many leading laboratories. Spin-polarized scanning tunneling microscopy can be used in materials science for establishing an understanding of magnetic structures [3] and can serve as a basis for development of a high-density magnetic storage device.

STM is a non-optical microscope with atomic resolution; further, it provides the possibility to perform

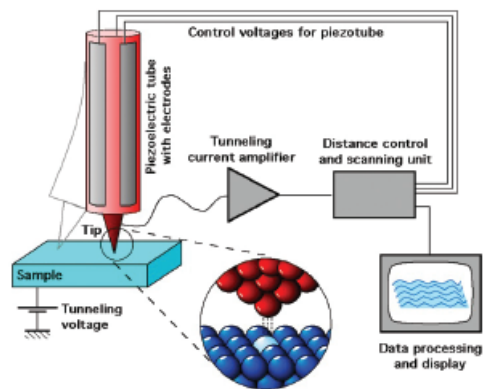
manipulations on surfaces at atomic level. A schematic view and a picture of the first implementation of this powerful tool that set off fireworks for innovations in nanotechnology are shown on the next page. The working principle of STM is very simple: A sharp metallic tip approaches the sample surface as close as a couple of Ångstroms (10 Ångstroms = 1 millionth of a millimeter). A voltage of around 1V is applied between the tip and the surface. Although the tip and the surface have no physical contact, we can measure a small current (typically on the order of a nanoampere), the so-called tunneling current, between the tip and the surface. STM operates in two modes, namely the constant height mode and the constant current mode. In the constant height mode, the tunneling current is measured at different lateral positions while the height of the tip is kept constant. In the constant current mode, the height of the tip is measured while the current between the tip and the surface is kept constant utilizing a feedback loop.

The phenomenon of tunneling, and therefore the tunneling current, can only be explained by quantum theory. Quantum mechanical tunneling has been considered as a miracle since its discovery, because a particle can cross a barrier with an energy that is lower than the barrier height. In order to describe the impact of this phenomenon, we can consider the particle as a ball that needs to go through a wall (the barrier). Classically, there are two

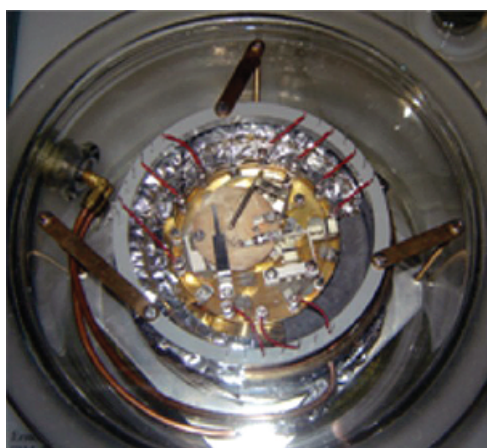
possible ways of passing the wall: The ball has to gain enough potential energy to pass the wall from above or it has to gain a sufficiently high kinetic energy to shoot a hole in the wall. In the microscopic world, described by quantum mechanics, the particle can also pass the barrier without destroying the barrier or gaining enough energy to go above the barrier. Description of tunneling through a barrier in one dimension can be found in any quantum physics textbook (see, for example, [5]). In one dimension, tunneling is generally an easy mathematical exercise. The particle can choose only a single path to cross the barrier. If we generalize this problem to three dimensions, we can easily verify using our understanding from classical physics that the particle can choose many different paths, as described in the path integral description of quantum mechanics by Feynman [6], which is based on the work of Dirac [7]. The three-dimensional description is far more difficult compared to the one-dimensional description [8]. In order to describe the tunneling process of STM, a source theoretical description has been developed [9], where the metallic tip is considered as an electron source, emitting electrons that scatter at the surface atoms and return back to the tip, carrying all the information about the surface. This theoretical approach models the whole STM aperture exactly. All other theoretical approaches for the description of STM can be proven to be the limiting cases of the source theoretical description. As shown in [9], the so-called standard model of STM by Tersoff and Hamann [10] is the limiting case for a point-like tip. Nevertheless, the basic issue is still modeling of the tunneling mechanism in three dimensions. Strongly correlated to this problem is the tunneling time problem. Measurement of time on the microscopic scale has so far been not possible since time cannot be defined on a microscopic scale uniquely. An



Mustafa Riza



Schematic view of an STM (reproduced from [4])



First implementation of STM (photo taken by the author at the German Museum in Munich, August 2005)

approach for modeling of the tunneling time in one dimension was proposed in [11]. It seems evident that the tunneling time problem is fundamental, as discussions on superluminal (i.e. faster-than-light) tunneling indicate [12].

A recently funded EMU Type-A research project, planned to be completed in September 2008, is dealing exactly with the fundamental problem of tunneling time, three-dimensional tunneling, and spin-polarized tunneling. New models for three-dimensional tunneling are going to be developed by the author and Hale Paşaoğlu, a Ph.D. candidate in Department of Physics, whereas numerical simulations of these models will be performed together with Cem Kanoğlu, a Ph.D. candidate in Department of

Mathematics. Theoretical findings will be verified by comparing the results to experimental data obtained in previous studies [3, 13].

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A collaborative study for the continuity of traditional environments in rural vernacular settlements of Northern Cyprus

By Özlem Olgaç Türker and Hıfsiye Pulhan

The island of Cyprus, of which northern side was isolated until recent years physically, socio-economically as well as politically from the international arena, exhibits unique Mediterranean architectural characteristics, especially in rural areas [1-4]. For many years, the indeterminate political situation and lack of economical welfare in North Cyprus helped preserve the originality of traditional environments [5, 6]. Moreover, unlike other Mediterranean regions, North Cyprus witnessed a slow construction rate, especially with regards to tourism architecture. These factors contributed to the 'un-spoilt' label given to Northern Cyprus by foreign tourism companies [7].

However, the negotiation process on the Annan Plan, with a special emphasis on land-ownership issues, both raised the land prices and accelerated the construction rate in North Cyprus,

along with a flow of foreign investors drawn by the prospect of EU membership. Currently, Northern Cyprus is preferred as a living environment as well as a tourism investment region by numerous Europeans because of low land and property prices compared to other European countries. Consequently, previously untouched regions of North Cyprus have started to face destruction by unplanned new constructions, causing loss of natural and architectural heritage, even in rural vernacular environments of the island [8]. Without any doubt, these recent developments are shaped by the international interest and investment in cooperation with local construction firms and estates importing common architectural images from all over the world. When the current living styles, tastes and preferences of people and the prevailing power of media upon them are considered, recent construc-

tion activity in North Cyprus can be regarded as an erosion of tradition [9].

Many scholars emphasize the importance of history and culture for regional tourism development [10-12]. Tourism, in turn, can be very destructive to the environment, particularly in less developed countries. As Feilden mentions [11], over-developed tourism industry destroys the resources and values, which were what attracted visitors in the first place. North Cyprus construction industry has already faced such a threat that can be linked to dissatisfaction of foreign customers, leading to a decrease in foreign investment due to lack of development infrastructure. Unless a strategic plan is implemented urgently for both new developments and adaptively re-used buildings in the historical context, the outcome of the ongoing process will be irreversible in terms of the cultural and architectural heritage of North Cyprus.

In the light of these concerns, a subcommittee was formed last year for the analysis of deteriorated historical and traditional buildings in villages in the district of Girne. Upon the request from the Local Administrative District of Girne (Girne Kaymakamlığı) and the initiative of TRNC High Commission of Antiquities (Anıtlar Yüksek Kurulu), members of the subcommittee were



Members of the team formed to carry out a study on continuity of traditional environments in rural vernacular settlements of Girne, North Cyprus. From left to right: Gülnur Tokay (Department of Antiquities), Arif Dirikli (Department of Antiquities), Hande Terzioğlu (Department of Antiquities), Özlem Olgaç Türker (Eastern Mediterranean University), Hıfsiye Pulhan (Eastern Mediterranean University), Mücahit Tüfekçi (Land Registry Office), Murat Karanar (Local Administrative District of Girne), Mehmet Envergil (Civil Engineer, Local Administrative District of Girne)

selected from related governmental and non-governmental organizations as well as from universities: Özlem Olgaç Türker (Department of Interior Architecture, EMU) as the representative of The University, Hıfısiye Pulhan (Department of Architecture, EMU) as the representative of the Union of the Chambers of Turkish Architects and Engineers (Kıbrıs Türk Mühendis ve Mimar Odaları Birliği), Hande Terzioğlu from the Department of Antiquities (Eski Eserler Dairesi), Hülya Yüceer as the representative of Cyprus International University, Mehmet Envergil as the representative of the Local Administrative District of Girne, and Mücahit Tüfekçi as the representative of the Land Registry Office (Girne Tapu Dairesi) formed a team to carry out weekly field work in different villages.*

The aim of this subcommittee is to develop sustainable methods and proposals for the continuity of vernacular environments that are the reflections of social and physical characteristics of the lifestyle that once existed in Cyprus. In addition to conservation of monumental and civil architecture in vernacular villages, the study envisions transmission of these physical and social environments to future generations through revitalization projects.

Since the cultural and historical heritage does not only belong to the country in which it exists, but also to the whole world and all human beings, implemented activities should support the continuity of the cultural and historical assets worldwide. Besides the significance of conservation in traditional contexts, economical viability of these environments has to be considered as well. Therefore, the envisioned model has to have a holistic and sustainable approach. Up to now, documentation and inventory studies on eight of the villages have already been completed

out of thirty-one rural settlements included in the study. In each village, the socio-physical context of the rural vernacular environment is analyzed in terms of topography, climate, local materials, construction techniques, and their collective role in shaping the rural pattern. Additionally, demographic characteristics of the inhabitants, past experiences, events, and actors in the history of the villages are considered as sources for the analysis of the settlements. Parallel to these investigations, an inventory study of specific-functioned buildings, e.g. religious, educational or industrial, is carried out for listing monumental and/or unique buildings. Field studies reveal that there will be three levels in conservation decisions of these villages: (1) level at the village scale, (2) level at the group-buildings scale, and (3) level at the single-building/site scale.

The report on Akçiçek Village, which is a pilot study on the first type of classification, covers a SWOT analysis to identify the strengths, weaknesses, opportunities, and threats for the purposes of strategic planning and determination of a vision for the revitalization of this village. TRNC High Commission of Antiquities has already approved the report which describes the results of the SWOT analysis, socio-cultural and natural significance of Akçiçek village, its architectural characteristics and the potential of the village for future developments. Reports on other villages will be prepared using the data collected during the field studies and will subsequently be submitted to the Commission in the upcoming months.

Conservation and renovation of deteriorated buildings for the continuity of the historical patterns and revitalization of the villages are the primary concerns of the study; however, if a site includes a deteriorated and dangerous building that is neither the component of a historical pattern nor has an evidential value, and if the loss

in mass is at an irreversible level, then the subcommittee makes a decision on whether or not to clean the site for new architectural constructions. Members of the subcommittee also aim to prepare a Guideline/Booklet on the architectural elements and details of the vernacular buildings for guiding the adaptive re-use implementations in certain vernacular environments, and to establish other study groups for strategic planning on revitalization of these environments through conservation, restoration, and rehabilitation implementations.

If design is understood as a unique tool that enables architects to shape not only living environments but also human behavior, then it can be stated that architects stand at a very challenging position since they may play a vital role in protection of natural and traditional environments while reshaping the contemporary developments on the island of Cyprus. Through sensitive designs and cooperation with different governmental and non-governmental organizations, several villages that are now at the point of deterioration can be revitalized and re-gained for future generations as well as for current needs of the people without drastically consuming the natural and economical resources. Implementation of a consistent and comprehensive sustainable conservation program will prevent the deterioration of traditional environment as well as the destruction of local fabric, ecological life and natural environment and will, at the same time, provide contemporary life conditions in these vernacular environments.

* Other universities and governmental organizations such as the City Planning Office (Şehir Planlama Dairesi) were also invited to assign representatives to work in this subcommittee.

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Synthesizing building blocks for future optical devices

By Süleyman Aşır



Süleyman Aşır working in his chemistry lab located in the Arts and Sciences Building

Let's dream about having quantum computers, incredibly fast supercomputers (target clock frequency: 500,000 GHz) that could handle extremely complicated tasks. What about highly efficient solar cells that would convert solar energy to the energy demanded? Or healing agents that would be inserted into our body and could use molecular technology to reverse disease processes and injuries for improvement of health?

My Ph.D. research is on synthesis of chiral perylene and naphthalene diimides under the supervision of Huriye İcil from Department of Chemistry at EMU and co-supervision of Ayhan S. Demir from Middle East Technical University (METU) in Ankara, Turkey. I have been working on this project for about three years and it is exciting to see that the chemicals we synthesize demonstrate significant potential for a wide range of electronic, optical and medical applications.

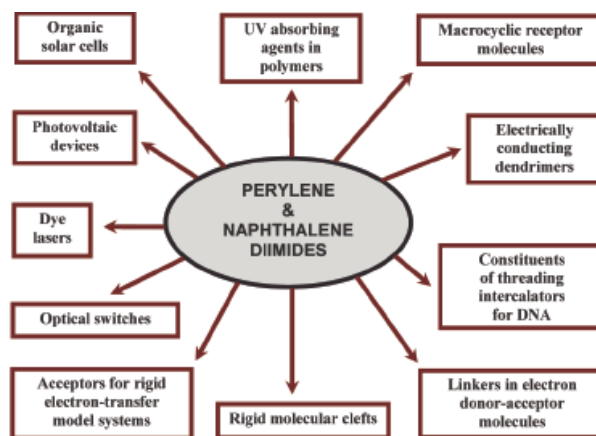
The electronic and optical properties of conjugated polymers and other organic semiconductors, now well-established classes of functional materials, are controlled by both the primary molecular

structure and by supramolecular interactions. Successful design of molecular architecture depends not only on the choice of suitable receptor units; an often underestimated factor is the influence of the substituents of the building blocks, where even small changes can lead to unexpected consequences for the superstructure. Introduction of chirality in the superstructure improves the quality of the spatial orientation and packing of the building blocks [1].

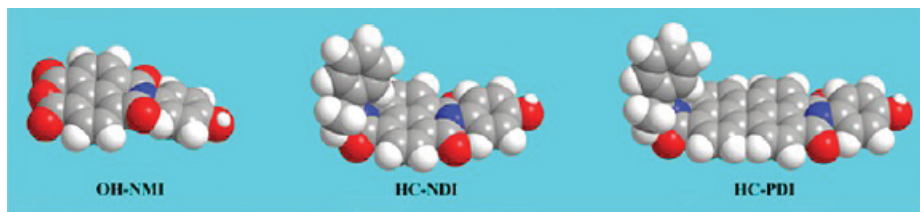
Perylenediimides, due to their outstanding chemical, thermal and photochemical stability, are highly promising

materials for organic solar cells, photovoltaic devices and dye lasers [2-5]. On the other hand, 1,4,5,8-naphthalenediimides have been used for preparation of electronically conducting materials, Langmuir-Blodgett films, π -stacked materials absorbing in the near-infrared region, and models for the photosynthetic reaction center [6, 7]. Naphthalene diimides find applications in biology and medicine, as well as in supramolecular chemistry. An increasing interest for these dyes originates from their electron acceptor properties and their photochemical stability [8].

Recently, we synthesized a number of chiral perylene and naphthalene diimides (OH-NMI, HC-NDI, and HC-PDI) and we investigated their optical, photochemical, thermal and electrochemical properties for potential use in many different applications including solar cells, optical switches and data storage devices, biological models for electron transfer, sensors, and supports for catalysis [9]. Synthesized compounds were analyzed using ultraviolet-visible and infrared spectroscopy, nuclear magnetic resonance, mass spectrometry, and a series of thermogravimetric, calorimetric, voltammetric, and polarimetric measurements. Some of these measurements were made in collaboration with METU and Max-Planck-Institut Für Bioanorganische Chemie (MPI) in Mülheim-Germany. Results of these measurements show that the syn-



Potential applications of perylene and naphthalene diimides



3D models of compounds OH-NMI, HC-NDI, and HC-PDI

thesized compounds have high thermal, electrochemical and photochemical stability, which is crucial for high-tech applications and devices.

Two of the synthesized compounds, namely HC-NDI and HC-PDI, have chiroptical switching ability and show excellent potential for optically active sensitizers in solar applications. Quantum computers, which will surpass conventional desktop machines in processing speed and capability, encode information as photons or minute particles of light. For a quantum computer, the signal is not an electrical current but of optical origin and is based on manipulation of photons. The chemicals we synthesize can act as molecular switches in future quantum computers.

At the same time, we are trying to modify the synthesized molecules and introduce them into the body as non-viral vectors for gene therapy. Preliminary experiments show that the interaction between these molecules and the DNA molecule can be used for gene therapy. Currently, we are in the process of designing non-viral vectors for treat-

ment of inherited genetic disorders as well as a wide range of metabolic, infectious, and inflammatory diseases.

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- their photovoltaic effect," *Applied Surface Science* **142**(1-4), 598-602 (1999).
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- [9] N. Pasaogullari, H. Icil, and M. Demuth, "Symmetrical and unsymmetrical perylene diimides: Their synthesis, photophysical and electrochemical properties," *Dyes and Pigments* **69**(3), 118-127 (2006).

■ Spring 2006-2007 Postgraduate Degrees (Addendum) ■

The following is a list of Spring 2006-2007 graduates who completed their master or doctoral degrees during the Summer of 2007. The list has been provided by the Institute of Graduate Studies and Research.

■ LLM ■

Tolga Atılğan (Law)

Thesis Title: Uluslararası Ticarete Kullanılan Ödeme Vasıtalarından Akreditif
Supervisor: Hasan İşgüzar

Ümit E. Durna (Law)

Thesis Title: Şahıs Şirketlerinde Ortakların Mali Hakları
Supervisor: Aynur Yongalık

Ülvi N. Gün (Law)

Thesis Title: Roma Hukukunda ve Türk Hukukunda Borçlunun Temerrudu
Supervisor: Erkan K. Güngör

■ MA ■

Leman Arıkbuka (International Relations)

Thesis Title: EU-NATO Security Relations since the Maastricht Treaty: Emerging Division of Labour
Supervisor: Wojciech Forsyski

Hatice Aydınleri (Banking and Finance)

Thesis Title: Turkish Cypriot Woman Entrepreneurs: An Examination of the Factor Affecting Their Business Performance
Supervisor: Hatice Jenkins
Co-Supervisor: Salih Katırcıoğlu

Arzu Bardak (English Literature and Humanities)

Thesis Title: East-West Dichotomy in Lessing, Conrad and Achebe
Supervisor: Prakash R. Kona

Barçın Boğaç (Communication and Media Studies)

Thesis Title: History of Cinema in Turkish Cypriot Society between 1913 and 1980
Supervisor: Onur Eroğlu

Banu Durdağ (International Relations)

Thesis Title: The Political Identity of the EU and Turkey's Europeanness
Supervisor: Erol Kaymak

Arkins M. Kabungo (Banking and Finance)

Thesis Title: Appraisal of the Zambia Smallholder Agriculture Production and Marketing Support Project: The Case of Paprika
Supervisor: Glenn P. Jenkins

Said M. Mohammed (International Relations)

Thesis Title: ECOWAS Capability in Conflict Resolution and Security
Supervisor: Moncef Khaddar

Elona Rusi (International Relations)

Thesis Title: Can the European Union Have its Own Immigration Policy? A Study of Difficulties and Potential Solutions
Supervisor: Wojciech Forsyski

Pranvera Sagajeva (Banking and Finance)

Thesis Title: Unilateral Euroisation in North Cyprus
Supervisor: Mustafa Besim

Chinonso F. Ubani-Ukoma (International Relations)

Thesis Title: Judicial Settlements of Interstate Territorial Disputes in Africa: Facts about Inhabitants and Identity - The Bakassi Peninsula Case
Supervisor: Wojciech Forsyski

Ofiong Whiley (International Relations)

Thesis Title: Achievement and Challenges of NEPAD/ Millennium Development Goals in Nigeria
Supervisor: Moncef Khaddar

Ana Yousefian (International Relations)

Thesis Title: The Syrian-Iranian Alliance: An Analysis of Regional Concern and Regional Perspective (From 1979 to the present)
Supervisor: Erik L. Knudsen

■ MArch ■

Halima L. Bashir (Architecture)

Thesis Title: Towards the Continuity of Vernacular Architecture: Re-examining Social Housing Schemes
Supervisor: Beril Ö. Mayer

Amir T. Habibabadi (Architecture)

Thesis Title: Influence of High Rise Building Forms on Earthquake Resistance
Supervisor: Munther Moh'd

Meray Taluğ (Architecture)

Thesis Title: Architectural Decorative Elements of Late Roman and Early Byzantine Monuments at Famagusta District
Supervisor: Netice Yıldız

Bahar Uluçay (Architecture)

Thesis Title: Houses with Two Independent Storeys in the Development of Modernization Process in Social and Urban Context: The Case of Nicosia (1940-1970)
Supervisor: Türkan U. Uraz

■ MBA ■

Osman Dağlı (Business Administration)

Thesis Title: Market Orientation: Relation to Competitiveness in TRNC Context
Supervisor: Mustafa Tümer

Birsen Halilsoy (Business Administration)

Thesis Title: Assessing the Quality of University Web Sites
Supervisor: Mehmet İslamoğlu

Rüştiye Y. Nizamoğlu (Business Administration)

Thesis Title: The Impact of Relationship Marketing Elements on Relationship Quality, Customer Satisfaction and Customer Loyalty in North Cyprus Banking Sector
Supervisor: Mustafa Tümer

Lem H. Nkwenti (Business Administration)

Thesis Title: The Importance of Internet Marketing on Higher Education: The Case of EMU
Supervisor: Mustafa Tümer

Özlem Özoğul (Business Administration)

Thesis Title: Disaggregated Investment: The Role of Tourism Investment in the Case of North and South Cyprus, 1977-2006
Supervisor: Sami Fethi

■ MS ■

Jamila M. A. Abdalhmud (Civil Engineering)

Thesis Title: Effect of Aggregate Size and W/C Ratio on Drying Shrinkage and Microcracking Behaviour of Concrete
Supervisor: Özgür Eren
Co-Supervisor: Tülin Akçaoğlu

Maneli Badakhshan (Computer Engineering)

Thesis Title: Analysis of Spreading Dynamics of Malware in Wireless Sensor Networks Based on Spatial Epidemic Models
Supervisor: Doğu Arifler

Özsen A. Diran (Civil Engineering)

Thesis Title: Solid Waste Management in Northern Cyprus
Supervisor: Ali Günyaktı

Akbar R. Firouzi (Mechanical Engineering)

Thesis Title: Effect of Heat-Treatment on Stress Corrosion Cracking of AISI Steel in 20% NaCl at 80°C
Supervisor: Filiz Sarıoğlu

Bengi Işıksel (Tourism Management)

Thesis Title: Relationship of Work Overload, Work Involvement and Interrole Conflict with Frontline Hotel Employees' Career Satisfaction and Turnover Intentions: Evidence from Northern Cyprus
Supervisor: Hasan Kılıç

Sara İzadpanahi (Electrical and Electronic Engineering)

Thesis Title: Motion-Based Localized Super Resolution Technique for Low-Resolution Video Enhancement
Supervisor: Hasan Demirel

Hüseyin Kusetoğulları (Electrical and Electronic Engineering)

Thesis Title: Real Time Detection and Tracking of Vehicles for Speed Measurement and License Plate Detection
Supervisor: Hasan Demirel

Erkan Özdemir (Civil Engineering)

Thesis Title: Estimating Hydropower Potential of Turkey
Supervisor: Ali Günyaktı

Neyre Tekbıyık (Electrical and Electronic Engineering)

Thesis Title: Closed-Loop Power Control with Fixed Step Size in DS-CDMA Cellular Systems
Supervisor: Aykut Hoca'nın

■ PhD ■

Suzan C. Buranay (Mathematics)

Thesis Title: Block-Grid Method for Solving Laplace's Boundary Value Problem on Polygons
Supervisor: Adigozal Dosiye

İdil Candan (Computer Engineering)

Thesis Title: Performance Analysis of a Time-Threshold Based Bandwidth Allocation Scheme for Cellular Networks
Supervisor: Muhammed Salamah

Turgay elik (Electrical and Electronic Engineering)

Thesis Title: Moving Object and Color Image Segmentation
Techniques Using Complex Wavelet Transform and Pixel
Statistic

Supervisor: Huseyin zkaramanlı

Burin zmen (Electrical and Electronic Engineering)

Thesis Title: Construction of Complex Wavelets and Multiwavelets
with Orthogonality and Symmetry and Their Applications

Supervisor: Huseyin zkaramanlı

Kıvan Yüney (Chemistry)

Thesis Title: Naphthalene and Perylene Polymers: Their
Synthesis, Photochemical and Electrochemical Properties

Supervisor: Huriye İcil

■ Recent Publications and Presentations (April - June 2007) ■

■ Journal Publications (ISI) ■

The journal publications presented are limited to those that are listed in Arts & Humanities Citation Index (A&HCI), Science Citation Index Expanded (SCI-Expanded), or Social Sciences Citation Index (SSCI). A search was performed on September 15, 2007 to automatically extract the indexed journal articles from ISI Web of Science®. The articles included in the list that follows have at least one author with EMU affiliation.

S. Abbasoglu and I. Sezai, "Three-dimensional modelling of melt flow and segregation during Czochralski growth of GexSi1-x single crystals," *International Journal of Thermal Sciences* **46**(6), 561-572 (2007).

S. Abbasoglu and I. Sezai, "Three-dimensional analysis of Marangoni flow and radial segregation in GexSi1-x melt with Czochralski configuration," *Engineering with Computers* **23**(2), 123-135 (2007).

S. A. Ali, N. S. Kambo, and E. A. Ince, "Exact expression and tight bound on pairwise error probability for performance analysis of turbo codes over Nakagami-m fading channels," *IEEE Communications Letters* **11**(5), 399-401 (2007).

H. Altincay, "Ensembling evidential k-nearest neighbor classifiers through multi-modal perturbation," *Applied Soft Computing* **7**(3), 1072-1083 (2007).

D. Arifler, "A methodology for root cause analysis of poor performance in fixed-wireless data networks," *IEEE Communications Letters* **11**(5), 381-383 (2007).

D. Arifler, I. Pavlova, A. Gillenwater, and R. Richards-Kortum, "Light scattering from collagen fiber networks: Micro-optical properties of normal and neoplastic stroma," *Biophysical Journal* **92**(9), 3260-3274 (2007).

Z. Bayram and R. Onder, "XSL transformations," *Dr. Dobb's Journal* **32**(5), 48+ (2007).

H. Caner, E. Yilmaz, and O. Yilmaz, "Synthesis, characterization and antibacterial activity of poly(N-vinylimidazole) grafted chitosan," *Carbohydrate Polymers* **69**(2), 318-325 (2007).

T. Celik, H. Demirel, H. Ozkaramanli, and M. Uyguroglu, "Fire detection using statistical color model in video sequences," *Journal of Visual Communication and Image Representation* **18**(2), 176-185 (2007).

M. Fehlmann, "Casts and connoisseurs – The early reception of the Elgin Marbles," *Apollo – The International Magazine of Art and Antiques* **165**(544), 44-51 (2007).

M. Halilsoy and O. Gurtug, "Search for gravitational waves through the electromagnetic Faraday rotation," *Physical Review D* **75**(12), 124021 (2007).

H. Komurcugil and O. Kukrer, "Globally stable control of three-phase three-wire shunt active power filters," *Electrical Engineering* **89**(5), 411-418 (2007).

Y. V. Rogovchenko and F. Tuncay, "Interval oscillation criteria for second order nonlinear differential equations with damping," *Dynamic Systems and Applications* **16**(2), 337-343 (2007).

E. A. Volkov and A. A. Dosiyevev, "A high accurate composite grid method for solving Laplace's boundary value problems with singularities," *Russian Journal of Numerical Analysis and Mathematical Modelling* **22**(3), 291-307 (2007).

R. Y. Yu, "Characterization and sampled-data design of dual-tree filter banks for hilbert transform pairs of wavelet bases," *IEEE Transactions on Signal Processing* **55**(6), 2458-2471 Part 1 (2007).

K. Yuney and H. Icil, "Synthesis, photochemical, and electrochemical properties of naphthalene-1,4,5,8-tetracarboxylic acid-bis-(N,N'-bis-(2,2,4(2,4,4)-trimethylhexylpolyimide)) and poly(N,N'-bis-(2,2,4(2,4,4)-trimethyl-6-amino-hexyl) 3,4,9,10-perylenetetracarboxydiimide)," *European Polymer Journal* **43**(6), 2308-2320 (2007).

■ Conference Papers and Presentations ■

The following list of conference papers and presentations may not be comprehensive as the information presented here has been put together based on e-mails sent to the newsletter staff by EMU researchers before September 15, 2007.

D. Abend-David, "Pound, Zukofsky and a City of Poets: A Negotiation of Literary and National Identities," The American Comparative Literature Association (ACLA) Annual Meeting, Puebla, Mexico, April 2007.

D. Arifler, I. Pavlova, A. Gillenwater, and R. Richards-Kortum, "Computational analysis of light scattering from collagen fiber networks," in *Proceedings of the*

International Society for Optical Engineering (SPIE) - Diagnostic Optical Spectroscopy in Biomedicine IV vol. 6628, European Conferences on Biomedical Optics, Munich, Germany, June 2007.

S. Aşır and H. İcil, "Synthesis of a rigid-flexible-rigid structure: A new bichromophoric perylene derivative," International Conference on Organic Chemistry, Erzurum, Turkey, June 2007.

E. Atasoylu, "Engineering Ethics Education and Engineering Practice: A Study from a Small Island with an Impressively Large Number of Engineering Programs," in *Proceedings of the 114th American Society for Engineering Education (ASEE) Annual Conference and Exposition*, Honolulu, Hawaii, June 2007.

J. B. Bodapati and H. İcil, "Förster (fluorescence) resonance energy transfer with a soluble fluorescent perylene polymer," International Conference on Organic Chemistry, Erzurum, Turkey, June 2007.

K. F. Boyacıoğlu and D. Arifler, "Second-Order Analysis of Formation of Holes in Spatial Point Patterns: Applications in Wireless Sensor Networks," in *Proceedings of the 5th International Symposium on Modeling and Optimization in Mobile, Ad Hoc, and Wireless Networks*, Workshop on Spatial Stochastic Models in Wireless Networks, Limassol, Cyprus, April 2007.

A. G. Chefranov, "Secure Hill Cipher Modification SHC-M," in *Proceedings of the International Conference on Security of Information and Networks (SIN 2007)*, Famagusta, Cyprus, May 2007.

H. Çakal, "Can We Live Together? A Cross-sectional Study of Prejudice and Interethnic Contact in a Cypriot Village," Cyprus Sociological Association Meeting, Intercollege, Nicosia, Cyprus, June 2007.

R. G. Demirci, V. Kışmir, and Y. Bitirim, "An Evaluation of Popular Search Engines on Finding Turkish Documents," in *Proceedings of the 2nd International Conference on Internet and Web Applications and Services (ICIW)*, p. 61, IEEE Computer Society, Morne, Mauritius, May 2007 [Selected as 'Best Paper'].

Ş. A. Gürel, E. Basri, and Y. Bitirim, "The Use of the Google Search Engine for Accessing Private Information on the World Wide Web," in *Proceedings of the International Conference on Security of Information and Networks (SIN 2007)*, Famagusta, Cyprus, May 2007.

H. İcil, "High performance fluorescence perylene diimides and polymers for photonic applications," International Conference on Organic Chemistry, Erzurum, Turkey, June 2007.

F. G. Lisaniler and S. Uğural, "Economic Convergence and Community Conflicts in European Union," European Consortium for Political Research (ECPR) 35th Joint Sessions of Workshops, Helsinki, Finland, May 2007.

D. Oktay and F. Conteh, "Towards Sustainable Urban Growth in Famagusta," European Network for Housing Research (ENHR) 2007: Sustainable Urban Areas, Rotterdam, Holland, June 2007.

D. Oktay and K. Pontikis, "The Quest for Sustainable Housing Patterns on the Island of Cyprus," Environmental Design Research Association (EDRA) 38: Building Sustainable Communities, Sacramento, California, May-June 2007.

M. E. Özser, H. İcil, and M. Demuth, "A comparative study on the cyclization efficiencies of polyalkenes initiated by photoinduced electron transfer," International Conference on Organic Chemistry, Erzurum, Turkey, June 2007.

N. O. Pagan, "The Literary Mind and Geometrical Thinking," The 2nd International Conference on Consciousness, Literature and the Arts, University of Wales, Aberystwyth, Wales, UK, May 2007 [Read by William S. Haney II].

C. Pinteá and P. Zhang, "Mappings with high dimensional critical sets," Algebraic Topology: Old and New (M. M. Postnikov Memorial Conference), Stefan Banach International Mathematical Center, Bedlewo, Poland, June 2007.

B. Rahnama and A. Elçi, "Applying ParseKey+ as a New Multi-Way Client and Server Authentication Approach to Resolve Imperfect Counter Utilization in IEEE802.11i for Impersonation Avoidance," in *Proceedings of the International Conference on Security of Information and Networks (SIN 2007)*, pp. 308-320, Famagusta, Cyprus, May 2007.

H. Refiker and H. İcil, "Solid-state fluorescence studies of newly synthesized N-(2-hydroxy-4-benzoic acid)-N'-(4-hydroxyphenyl)-3,4,9,10 perylenebis(dicarboximide) and N-(1-Dehydroabietyl)-N'-(4-hydroxyphenyl)-3,4,9,10 perylenebis(dicarboximide) toward organic solar cells

applications,” International Conference on Organic Chemistry, Erzurum, Turkey, June 2007.

A. Sözen, “The Cyprus Stalemate: Looking Ahead,” Cyprus: In Search for Peace, Foreign Journalists Association, Rome, Italy, April 2007.

A. Sözen, “The Cyprus Negotiations and the Basic Parameters,” The Cyprus Conflict: Looking Ahead, Eastern Mediterranean University, Famagusta, Cyprus, May 2007.

A. Sözen, “A Re-diagnosis of the Cyprus Conflict: Looking Ahead,” The 6th International Relations Conference, Middle East Technical University, Ankara, Turkey, June 2007.

B. Taneri and T. Gaasterland, “Intron-centric regulation of alternative exons in mammalian genomes,” The Biology of Genomes, Cold Spring Harbor Laboratory, New York, May 2007.

Ö. Toygar, “Sensitivity Analysis of Partitioning-based Face Recognition Algorithms on Occlusions,” in *Proceedings of the 6th World Scientific and Engineering Academy and Society (WSEAS) International Conference on Applications of Electrical Engineering*, pp. 21-27, İstanbul, Turkey, May 2007.

T. Uç, “Divanü Lugatı’t-Türk’ten Kazakçaya Atasözlerimizin İzinde,” Kazakistan ve Türkiye’nin Ortak Kültürel Değerleri Uluslararası Sempozyumu, Türk Dünyası Araştırmaları Vakfı, Abay Milli Devlet Pedagoji Üniversitesi ve Çukurova Üniversitesi Ortak Yayını, pp. 45-50, Almatı, Kazakistan, May 2007.

F. Uluç, E. Emirzade, and Y. Bitirim, “The Impact of Number of Query Words on Image Search Engines,” in *Proceedings of the 2nd International Conference on Internet and Web Applications and Services (ICIW)*, p. 50, IEEE Computer Society, Morne, Mauritius, May 2007.

D. Uzun and H. İcil, “Properties of self-assembled π - π stacks of perylene diimides,” International Conference on Organic Chemistry, Erzurum, Turkey, June 2007.

Y. Vural and A. Sözen, “The evolution of inter-communal conflict and the dynamics of current stalemate in Cyprus,” European Consortium for Political Research (ECPR) 35th Joint Sessions of Workshops, Helsinki, Finland, May 2007.

P. Zhang and C. Pinteá, “On smooth maps with critical points of a manifold onto a manifold,” Algebraic Topology: Old and New (M. M. Postnikov Memorial Conference), Stefan Banach International Mathematical Center, Bedlewo, Poland, June 2007.