



Volume 4

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Director's message

The mission of Arts and Sciences is to provide undergraduate engineering students with a high quality education which broadens and supports their intellectual and practical development through academic excellence, scholarly research activity and provision of the knowledge, skills and dispositions necessary to succeed in a globalized world. To achieve our mission, we endeavor to create a supportive environment that provides challenging, high-quality educational opportunities.

In this newsletter you will find numerous examples of how we are achieving the goals that have been set. Articles on Studio Physics and the new MSc in Applied Chemistry degree clearly illustrate ongoing efforts to provide evidenced-based curricular improvements. These innovative classroom practices are further supported by co-curricular initiatives to support student learning, including the Mathematics Learning Support Center (MLSC), the Writing Center, and Physics tutorials. Each of these efforts is described inside. Beyond the classroom, the efforts to raise awareness of global issues relevant to all of our lives are evident in the series of sponsored events described on pages 3-6. Of particular note are the initiatives that reach out into the community such as the Mathematics and Science League, the German Club, and the visits to PI by local high school students. Finally, you can learn about the exciting research being conducted by A & S faculty on pages 8-10. The strength and relevance of this research is indicated by the numerous keynote invitations that our faculty have received.

The programs and activities described in this newsletter are excellent signs that we are well on our way to achieving our vision of being the university of choice in the region for undergraduate engineering majors. I invite you to sit back and take time to read more about our activities and efforts.

Dr. Brian Bielenberg
Director, Arts and Sciences

Physics Department Studies 'Studio Physics' Approach

In spring, the Department of Physics began discussing 'Studio Physics' with faculty members of the Physics Department of the Colorado School of Mines (CSM). The CSM Studio Physics courses are notably popular with students and were shown to be more effective than the more traditional lecture and laboratory courses they replaced in 2001. Studio Physics belongs to a family of approaches sometimes referred to as SCALEUP (Student-Centered Active Learning Environment for Undergraduate Programs). The common design theme is a strong emphasis on students actively working together to learn. The discussions held between PI and CSM were organized by Dr. Ahmed Al Shoaibi through his coordination of the PI-CSM university collaboration. It was further supported by Dr. Brian Bielenberg, Director of Arts and Sciences. PI Physics faculty and staff have held conference calls with Dr. Vince Kuo and Dr. Patrick Kohl, leading Studio Physics instructors at CSM, to explore their experiences with Studio Physics

and to consider issues that PI might face if Studio Physics is adopted locally. After that, CSM shared access to their substantial online Studio Physics resources to allow PI faculty a more detailed look at what they do.

As a follow-up to these first steps, Dr. Bielenberg and Dr. Curtis Bradley extended a visit to Golden Colorado (both there for an NSF workshop) in order to observe CSM's summer-semester Studio Physics courses in operation. They observed both the Mechanics course and the Electricity & Magnetism course over a period of several days. During his visit, Dr. Bradley was able to discuss aspects of introducing and running such a course with the available CSM Physics faculty. Insights from this visit have since been shared and discussed in the PI Physics Department. As a direct consequence of this visit, Dr. Bradley and colleagues in the department are undertaking a small study involving studio-inspired course modifications to PHYS 191 during the fall semester of 2011.



CSM students actively engaged during a Studio Physics session

Special Events

It was yet another active year for The Arts and Sciences Events Committee, chaired by Dr. Mirella Elkadi. The committee organized a series of very successful events featuring distinguished scholars of international renown, as well as in-house presentations. The committee also organized the 2nd Students' photo competition.

Mr. Karl La Rowe



Mr. Karl La Rowe

The first event of the season on October 21 2010 was a workshop on transforming stress and its management, conducted by Mr. Karl LaRowe who is an international speaker, author and workshop presenter on the subject of energy and awareness. Mr. LaRowe began his presentation with a short history of the development of understandings of stress, quoting the Canadian endocrinologist Dr. Hans Selye's first scientific study on the subject, in which stress is defined as: "the non-specific response of the body to any demand for change." The workshop focused on how individuals react to stress in an effort to turn negative stress into positive stress. Of particular significance to the audience, it was noted that the learning process can be enhanced when highly-developed skills are matched with high-level challenges, while the reverse results in boredom; when low skills are met with low challenges.

Dr. Hamid Kayal



Dr. Hamid Kayal with Dr. Dennis Signer & Dr. Mirella Elkadi

In October 2010 Dr. Hamid Kayal, the CEO of the Centre Suisse d'Electronique et de Microtechnique (CSEM-UAE Innovation Center) in Ras Al Khaimah presented Solar Island, a unique technology platform for solar research and development. He also discussed other R&D projects of the centre. Dr. Kayal started his talk with an overview of the CSEM-UAE centre, a joint venture between CSEM Switzerland and the Government of Ras Al Khaimah. After a brief description of the company's role and mission, profile and operating mode, he explained the relevant issues of the local economy in Ras Al Khaimah, which led to the definition of CSEM-UAE's applied research focus on renewable energy and Clean technology. After that, he reviewed the center's activities and services; including the working principle, the lift up and the rotation test of the Solar Island. The presentation ended with a very interesting Q&A session.

Mr. Ali Obaid Al-Yabhouni



Mr. Ali Obaid Al-Yabhouni

As part of the 50th anniversary celebration of the Oil Producing and Exporting Countries (OPEC) the A&S Events Committee invited Mr. Ali Obaid Al-Yabhouni, General Manager of the Abu Dhabi National Tanker Company (ANDATCO) and the National Gas Shipping Company (NGSCO), and UAE Governor for OPEC. In his speech, entitled 'OPEC policies and their Impact on the Oil Industry and Country's Directions', Mr. Al-Yabhouni gave an overview of OPEC, its history, its role in stabilizing oil markets and its leading role in the oil markets centering on ensuring stability and protecting the planet aiming at a 40% reduction in carbon emission by mid-century.

Dr. Nawal Al-Hosani



Dr. Nawal Al-Hosani with Dr. Ismail Tag

Another very interesting and successful seminar organized by the A&S Events Committee in March 2011 was held as part of the 'Leaders in Engineering and Applied Sciences Seminars' series, which was led by Dr. Nawal Al-Hosani, Associate Director of Sustainability at Masdar. The title of the seminar was 'Abu Dhabi 2030: Masdar's Role in Bringing the Vision to Reality'. Dr. Al-Hosani started by introducing Masdar City; then she explained its vision, mission and main objectives presenting Masdar's different business units, along with their main projects and achievements. She also explained how the Abu Dhabi Economic Vision 2030 stated that through the diversification and broadening of the enterprise base across different sectors, the Emirate's aim was to create a stable and sustainable economy. She added that due to the anticipated levels of economic growth, one priority of this economic vision was to develop world-class infrastructure to support and sustain this. However, nowadays with the growing awareness of human impact on the environment and site change, the calls for greener solutions are getting louder. To answer these urgent calls for change, Abu Dhabi took the decision to create Masdar as this would not only support Abu Dhabi's effort to diversify the economy but at the same time help the global challenge in combating climate change.



Dr. Nawal Al-Hosani with faculty and students

Dr. Abdullah Al-Shami



Dr. Abdullah Al-Shami

For the 2nd consecutive year, Dr. Abdullah Al-Shami, Professor of Comparative Islamic Jurisprudence and Islamic studies in the A&S pro-

gram provided the faculty and students on both campuses with a very informative and ethical presentation entitled 'Ascertain the truth: Authenticating Evidence in Islamic Jurisprudence' in which he explained the effect of spreading news or rumours on our community.

In his presentation, which was given in Arabic, Dr. Al-Shami outlined the rules of Islamic law in searching for the truth as laid out in Islamic jurisprudential scholarship, from the medieval period to the present day, with respect to the various schools of jurisprudence. He explored the meaning of testimony in the classical Islamic institution of learning in its literary and historical context. Another point of interest was the scale and state of being of upright character or upright and just, 'adala'. To ascertain these, Muslim scholars developed a set of criteria that enabled the grading of news 'khabar' transmitters initially on the binary of impugment 'al-jarh' and validation of the probity and uprightness of character 'al-ta'dil'. Finally, the talk addressed the issue of personal responsibility when an individual unknowingly spreads false information.

Students' Ethics Seminar

The last seminar of the season was a very informative seminar led by Dr. Abdullah Al-Shami and presented by his students: Osama Herzallah, Mohammed Al Khaled, Khalifa AL Hameeri, Khawar Shahid, Walid Khaled and Waleed Saleh. The Seminar was entitled: Avoiding the Sins of the Body Parts and discussed the ethics

of the body, moral concepts and the specific sins of the body as well as how they can be avoided. More specifically, the presentation outlined the body parts mentioned in the Holy Quran and Sunnah and how to avoid misusing them. The presentation also mentioned the punishments and rewards of misusing and protecting these parts respectively.



Dr. Al-Shami with student presenters

Photo Competition

The 2nd Students' Photography Competition was organized by the A&S Events committee in February 2011. Both male and female students of the PI participated. The theme of the competition was 'Life in the UAE' in three categories:

Architecture, Culture and Nature & Landscape.

The event was very successful with over one hundred entries, the majority of the photographs received were of a very professional standard

which made judging the competition very challenging. During the award ceremony the winners explained how, where and why they took their photo.



Winners of 2nd Students' Photography Competition 2011



Department Events and Activities

Colloquium Series

The Mathematics Department continued to host the colloquium series on “**Mathematics and its Applications**”.

The purpose of the ongoing colloquia is to bring together mathematicians, engineers and researchers in any field having a substantial mathematical content in order to provide a regular U.A.E. based platform for the exchange of recent developments, and to cultivate collaborative working relationships among the participants.

The organizers encourage the participation and presentation of talks by interested faculty/students/visiting scientists affiliated to the Petroleum Institute as well as Universities/Institutes in the U.A.E.

The inaugural seminar for the 2010-2011 academic year was given by Dr. Ryan I. Fernandes (A & S, Mathematics Department), whose talk

was titled: “Alternating Direction Implicit Orthogonal Spline Collocation Methods for Parabolic Partial-Integro Differential Equations”.

The various speakers and their affiliated institution are given in the following table.

Dr. Ryan I. Fernandes	Mathematics Department, Arts and Sciences, PI
Dr. Jyotshana Prajapat	Mathematics Department, Arts and Sciences, PI
Dr. Yap Yit Fatt	Mechanical Engineering Program, PI
Dr. Alip Mohammed Alifu	Mathematics Department, Arts and Sciences, PI
Dr. Ioannis G. Economou	Associate Provost for Graduate Studies and Professor of Chemical Engineering, PI
Dr. Efimov	Math Dept, Lomonosov Moscow State University
Dr. Ayjama Abdurahman	Computational Nanoscience and Materials Group, Department of Physics Bilkent University, Turkey.
Dr. Amjad Tuffaha	Mathematics Department, Arts and Sciences, PI
Dr. Alejandro Rodriguez-Martinez	Mathematics and Statistics Department, The College of Arts & Sciences, Zayed University, Abu Dhabi.
Dr. Uwe Kruger	Chemical Engineering Program, PI
Dr. Fahir Talay Akyildiz	Mathematics Department, Arts and Sciences, PI

Mathematics & Science League at PI 2011

The third Mathematics & Science League at PI (MSLPI) was hosted once again at the Petroleum Institute on March 17th, 2011. Taking part this year were students from Abu Dhabi based schools: Glenelg School of Abu Dhabi, Al Nahda National School (Boys) and Al Nahda National School (Girls). A total of 36 boys (GS – 11 and ANNS – 25) and 33 girls (GS – 13 and ANNS – 20) participated in the league.

The girls competed for prizes in Individual and Team Championships at the PI's Arzanah campus, whilst simultaneously, the boys entered into intellectual combat for similar prizes on the PI's male campus.

The competition began with 75 minutes of individual-based events and after a lunch break a 60 minute team event was conducted. The format of the competition was as follows:

- 25 minute individual physics round
- 25 minute individual chemistry round
- 25 minute individual mathematics round
- Lunch for the contestants and organizers / helpers
- 60 minute team round involving a mix of physics, chemistry & math questions
- Prize giving ceremony.

The occasion was marked with the presentation of prizes at both campuses by Professor Ismail A. Tag, the Senior Vice President and Provost of the PI.

The prize winners for the Individual Championship competitions were:

Boys	Girls
Individual Championship	
First Place: Mujtaba Munashir [Al Nahda National School (Boys)]	First Place: Samreen Jeelani [Al Nahda National School (Girls)]
Runner Up: Basel Moslem [Al Nahda National School (Boys)]	Joint Runners Up: Ayesha Hafeez [Al Nahda National School (Girls)] & Nourhan Saleh Abd-Elhamid [Al Nahda National School (Girls)]
Best Student (from Glenelg School of Abu Dhabi): Naser Baloochi	Best Student (from Glenelg School of Abu Dhabi): Reem Malas

The prize winners for the Team Championship competitions were:

Winning Team	
Al Nahda National School (Boys)	Ehsan Ahmadi
	Daniel Asef
	Ahmad Mahfouz
	Ataq Shah
	Husban Ahmed
Runner Up Team	
Al Nahda National School (Boys)	Basel Moslem
	Mansour Al Darei
	Abdul Rahman Samadi
	Abdullah Al Naqeeb
	Sameed Bin Ejaz
Winning Team	
Al Nahda National School (Girls)	Samreen Jeelani
	Ayesha Hafeez
	Dana Hisham Ali Mohammed Al Shamasneh
	Muna Majeed Mahmood
	Saara Mohamed Abdulla
Runner Up Team	
Glenelg School of Abu Dhabi	Zoha Aoraiath
	Fatima Bin Braik
	Tala Turjoman
	Nada Al Mohmeed

The questions set for the competition were of a challenging level and certainly stretched the students. Nonetheless, the participants found the event to be stimulating and agreed that they had all gained from the experience.

Helping to ensure the success of the event were the following individual volunteers:

Arzanah Campus

PI student helpers:

Yousra Hedi Guefrachi, Noha Ahmed Al Shiubini, Aya Nashat, Aneesa Ijaz, Mariam Adel Malas

Photographer: Rosma Suagie

Assisting school teachers:

- Ms. Lucy Abraham (Al Nahda National School (Girls))
- Ms. Hazar Kabbara (Glenelg School of Abu Dhabi)
- Ms. Ghina Fawwaz (Glenelg School of Abu Dhabi)

Male Campus

PI student helpers:

Mohamed Mahfooh, Ali Hussien Ali Shamlan Al Masabi, Mohamed Ali Al Kendi, Faris Ahmed Ali Al Zaabi, Mohamed Al Menhali

Assisting school teachers:

Mr. Hassan Suhie (Glenelg School of Abu Dhabi) & Mr. Bassam Saliba (Al Nahda National School(Boys))

The individual PI faculty members who were involved with the organizing logistics of the event were:

Organizing committee:

Drs. Jaap Geluk, Xun Wang, Khalid Dib, Ryan Fernandes

Question setters:

- Math: Drs. Sean Stewart, Gary Miller, Graeme Ward, Mariam Al Hanai.
- Chemistry: Dr. Issam Kobrsi
- Physics: Dr. Curtis Bradley

On-site helpers:

Male Campus: Drs. Kevin Dean, Curtis Bradley, Xun Wang, Jeff Seela, Amjad Tuffaha, Jaap Geluk, Ryan Fernandes.

Arzanah: Drs. Abdellatif Bouchalkha, Reza Najafzadeh, David Allison, Trung Dinh Tran, Mutasem Sinnokrot, Andry Didenko, Mirella Elkadi, Colin Francis, Khalid Dib.

German Club

There has been plenty of activity on the German front. In February, an exhibition of photo posters was organized jointly by the German Club and the German Embassy, with the support of PI management. The title of the exhibition was "Contemporary Architecture in Arabia" and the opening ceremony was initiated by the Provost, who welcomed distinguished guests: the German Ambassador to the UAE, the State Secretary of the German Ministry of Transport, Build-

ing and Urban Planning, and the CEO of ADCO, Mr. Abdul Munim Saif Al Kindi.

Other events organized by the German Club included a visit to a camel milk chocolate factory, run by a German CEO, a visit to the PI by 12 students from the Technical University of Freiburg, and a German-Arabic cultural evening, featuring the German jazz band "Tatara", whose music inspired PI students to dance.



Opening ceremony of the exhibition "Contemporary Architecture in Arabia"



The German Jazz band "Tätärä" at the German-Arabic Cultural Evening 2010

Visits by the British Community School Al Khubairat

On March 7th 2011, Chemistry students from Year 12 at the British School Al Khubairat in Abu Dhabi visited the PI. They were given a tour of the Chemistry Laboratories and Chemical Instrumentation facilities by Dr. Mirella Elkadi, in collaboration with Drs Issam Kobrsi, Jeff Seela and Sulafudin Vukusic.



Visit of the British school students to the Organic laboratories

The visit to the PI, organized by Dr. Mirella Elkadi, was a great success. It provided a valuable opportunity to establish contact between the PI and the school.

On April 17th and 21st, Year 13 Chemistry students were granted permission to visit the Organic Chemistry laboratories in Arzanah and Bu Hasa respectively as "shadow students". The visit started with a pre-lab lecture, given by Dr. Elkadi, in which she described the theory associated with the lab as well as the safety aspects of the experiment. The BSAK students then

watched PI students performing the preparation of 3-methylbutyl acetate, better known as the "banana ester" because it is the molecule that gives bananas their characteristic smell.

The feedback from both sides was extremely positive; the BSAK students described it as a very valuable experience, since they were able to see some very advanced equipment being used, which so far they had only learnt about in books. As for the PI students, they enjoyed the responsibility of acting as instructors for the BSAK students.

Innovation and Development of Curriculum

M.Sc. Degree in Applied Chemistry

The M.Sc. degree in Applied Chemistry (MSAC), under the leadership of Dr. Avin Pillay, received accreditation by the UAE Ministry of Education in September, 2011. During the accreditation process in Spring 2011 an External Review Team (ERT) from the Ministry – including accreditors from Imperial College, UK and Seton Hall University, USA – visited the Chemistry Department at the PI for 3 days from 28th – 30th March. The concluding remarks of the ERT were that: "PI's dedication to research is readily evident in the extensive number of unusually well equipped laboratories and a highly qualified laboratory support staff. [...] Fundamentally, the proposed MSAC Program is well designed and may be expected to accomplish the goal of equipping students with the knowledge and skills to perform advanced research and complex work in applied chemistry and related fields." This response was very encouraging, and the PI is now set to launch the degree in Fall 2012.



GRADUATE PROGRAM APPLIED CHEMISTRY (MASTER OF SCIENCE)

Be part of the country's most dynamic applied science & engineering institution



Why Applied Chemistry at PI?

- Internationally recognized faculty
- Leading science and engineering institute in collaboration with ADNOC and major international oil companies
- Our graduates develop strong backgrounds in science and engineering and often pursue PhDs at top USA universities
- Opportunity to work with ADNOC and OPCO's
- Opportunity to participate in leading international conferences
- Opportunity to work with graduate students from diverse backgrounds

Graduate Program

- Master of Science (32 credits)
- Combination of chemistry, science and engineering to meet the requirements of the petroleum industry
- Special training on state-of-the-art instruments for scientists and engineers
- Exposure to modern developments in technology

Where our graduates with an advanced degree go

- Pursue PhD
- Technology development in international organizations
- Work in PI-sponsored organizations: ADNOC and major international oil companies

Student Activities

- Regular sports events
- Recreational trips and visits
- International community events



Exciting Prospects in Applied Chemistry

- Polymers and Nanomaterials Chemistry
- Petroleum Production & Process Chemistry
- Industrial Catalysis
- Fuels and Alternative Energy Sources
- Corrosion Science & Physical Chemistry
- Environmental Science & Water Technology
- Computational Chemistry
- Organometallics / Applied Inorganic Chemistry
- Modern Instrumentation and Applied Organic Chemistry
- Spectrochemical Studies

FOR FURTHER INFORMATION: Graduate Office: http://www.pi.ac.ae/PI_ACA/pgp/; Chemical Engineering: http://www.pi.ac.ae/PI_ACA/ce/; or Email us at ALLgs@pi.ac.ae

Graduate Support Courses

The communication department introduced a new course (COMM501) in the spring semester (taught by Drs. Roger Nunn and Caroline Brandt) in Technical and Scientific Writing. The course is designed to support graduate students in drafting dissertations and academic articles in their engineering and applied scientific disciplines. This new initiative draws on the communication department's long-term PI-funded research project into academic competence.

A new graduate level course has been approved on Mathematical Modeling in Engineering and is to be offered in the spring of 2012.

Supporting Students

MATH LEARNING SUPPORT CENTER (MLSC)

The Mathematics Learning Support Center (MLSC) is a sub-unit of the Independent Learning Center (ILC) set up for the purposes of providing services specifically designed to help any PI student in his/her learning of mathematics. This facility has been incorporated within each of the two existing ILCs, and offers students an alternative user-friendly type of environment in which to improve their math skills on a drop-in basis. The MLSC is equipped with a variety of resources designed to enhance the math education of engineering undergraduates. These include in-house prepared paper-based self-study materials, a comprehensive set of workbooks designed to assist engineers learn mathematics, a variety of reference texts and computer-based tools.

Throughout the fall and spring semesters students from the AUP and engineering programs were appreciative of the extra one-to-one help offered by AUP/A & S math instructors, who devoted time and effort contributing their services to the MLSC. The individual math instructors who volunteered to staff the Center during both semesters were: Gary Miller (AUP Math), Ernest Afari(AUP Math), Mariam Al Hanai, Trung Dinh Tran (AUP Math) and David Allison (A & S Math).

In the near future the MLSC is hoping to expand the resources available to the students through the purchase of instructional DVDs covering topics in the calculus sequence, probability and statistics, linear algebra and differential equations. In addition, the Center seeks to bolster its resources via the inclusion of student -friendly electronic books (e-books) covering areas such as pre-calculus, introductory calculus and advanced engineering math.

A major long-term goal is to integrate the MLSC into the learning ethos of the PI. In time, the Center can positively influence how a given math topic is taught within the PI, rather than responding to a specific problem that a particular student has at a particular time.

Physics Department Provides New Tutoring Program

In response to a request from PI management, the Physics Department initiated a novel tutorial program to provide additional support to students struggling in their introductory Physics courses. The program began by identifying 'at-risk' students near mid-semester. For each student, faculty developed individualized study contracts based on the student's test and midterm exam performance. The resulting contracts involved weekly meetings of each student with their instructor, several hours per week of mandatory student attendance during afternoon tutorial sessions, and sets of tutorial review problems. The tutorial sessions ran daily in both Arzanah and Bu Hasa for 3 to 4 hours per day. The sessions provided an opportunity for students to work together on problems in a semi-relaxed setting, with support as needed from lecture and lab instructors. At the end of the semester, many students expressed their appreciation for the program.



PI students during a Spring 2011 Physics Tutorial session

Student Comments about the Tutorial Program

Salem

I think that Physics Tutorial Program will help students to have better understanding of the material. It helped me a lot last semester.

Fatima

[I think the program] helps students understand the concepts by themselves. It generates self-confidence in solving any kind of Physics problem... You have to do this every semester, even in the summer !

For fall semester 2011, the above program will continue with some modifications. The tutorial program is to start earlier in the semester and

it will be initially mandatory for all students. As student progress is charted and their needs identified, adjustments will be made according to individual needs.

Communication Department Writing Centers

As part of its mission to support the ongoing development of students' writing skills across the curriculum, the Communication Department continues to develop its two Writing Centers which first opened in 2009. The Writing Center for male students has moved to Room 2-228A in the Independent Learning Centre in Bu Hasa Building, while the Center for female students is located in the Communication Center (8-241) in Arzanah building..

The Writing Centers offer support to all students, regardless of degree, major, course or year of enrollment. Students may be engaged in preparing for degree study, or may be following an undergraduate or graduate program; they may seek support with writing set as part of required courses, such as PEEG 1: Overview of the Petroleum Industry or CHEG 490: Senior Design Project, or as part of electives such as H&SS 221: Introduction to Political Science. They may seek assistance in writing a wide range of documents, including technical reports, proposals, correspondence and resumes, or sections of documents such as abstracts, conclusions or reference lists. Students may also seek help with any stage of the writing process, from brainstorming and gathering sources to preparing an outline or drafting.

Management and supervision of the Writing Centers is provided by Communication Department faculty. Center design, however, reflects the belief that Petroleum Institute students, as they progress, become well-equipped to learn to tutor less experienced students, and that such peer tutoring arrangements offer a number of benefits to both the tutor and the tutored. The experience can provide peer tutors with opportunities to develop their communication and interpersonal skills, while the tutored student receives empathetic and focused support. A key feature of the design of both centers therefore is that tutoring is provided for students by students. One student is also appointed as a Center Administrator each semester, a position that carries particular responsibility for recording facility usage.

Students who meet certain criteria are eligible to apply for a position as a Writing center tutor. Criteria include:

- A minimum CGPA of 2.5.
- A good conduct record.

- A grade 'A' in Communication 151.
- The recommendation of his / her Communication 151 instructor.
- Interest in both tutoring and written communication.
- A minimum of 2 hours a week availability.
- Ability to attend 2 days' of training.

Students who meet these criteria can apply to undergo 'Learning to tutor' training, which takes place twice a year, at the start of each semester. Currently, there are seven male tutors, as follows:

- Anas K. A. Najy (Administrator)
- Bilal Shakeel Ahmed Butt
- Abdulrahman Hamdi Mohammed Hassanein
- Wessam Eldeen Mohammed Abdlgadir
- Ramy Mohamed Ahmed Kandil
- Hasan Mohammed Hasan Zakaria
- Mohamed Al Rahman Tutir Rahman Mohamed

The following female tutors currently provided support in the Writing Center in Arzanah:

- Aya El Badawy (Administrator), Alaa Shbair,
- Yasmin Abu Hijleh, Mais Suleiman, Zahraa
- Yousif, Sara Bakhti, Sara Hasrat Khan.

These tutors continue to receive support throughout the semester from faculty who are assigned as their mentors. In Arzanah, for example, AUP faculty John Langille and Shari Corbin, and Communication faculty Dr. Sivakumar Sivasubramaniam, performed this role for WISE Program students during academic year 2010-2012.

The Writing Center services are advertised extensively across the campus. Students also receive emails and text messages informing of them of the opening of the Centers and their hours of operation each semester. Students seeking support can make appointments with tutors or drop in as they wish. In the Spring 2011 semester, for example, 24 hours of tutoring per week were available to male students while female students were offered 27 hours. Feedback and usage data indicate that the service is very much appreciated by students and faculty alike.

Writing Centre Director, Dr. Caroline Brandt, Associate Professor of Communication, presented with Mariam Al Rashid and colleagues David Dalton (Men's College Writing Centre Director & Senior Lecturer, Communication) and John Langille (Lecturer, AUP), giving a presentation entitled: "The Development and Implementation

of a Student-delivered Writing Center Service at an Engineering University in the UAE". In their presentation, the team presented the results of preliminary student-led research into the use and non-use of the Petroleum Institute's Writing Centers, concluding with a number of recommendations aimed at attracting students to the centers, and retaining them.

The Writing Centers continue to develop. Priorities in the short term include extending training to meet the needs of experienced tutors, and enhanced Center promotion with the aim of improving attraction and retention of both tutors and students. For the Centers to continue to be successful, it is also essential that they receive full support across the curriculum from faculty who encourage their students to take advantage of the facility, and we are currently investigating ways of enhancing faculty awareness of the service and its benefits.


For more information please contact Caroline Brandt (WISE Program Writing Center) or David Dalton (male students' Writing Center).

Very many thanks to everyone whose sterling work has contributed to the success of both Writing Centers in 2010-2011!

The Petroleum Institute's Writing Centers: How do they work?


The Writing Centers (Rms 8-241 and 2-228A) give all students the opportunity to consult trained peer tutors about any aspect of academic writing or the writing process.

Peer tutors must be good writers themselves. They complete several hours of training and are given on-the-job support. The schedule in the Writing Centers shows their availability.



To see a peer tutor, you can make an appointment OR drop in.

You will see advertisements for the centers everywhere.



Students can go to a peer tutor when they have been assigned a writing task by an instructor or once they have written a draft.

Peer tutors can guide students to check these aspects of their work:

- Planning:** Preparing an outline and identifying good sources for a literature review.
- Task fulfillment:** Ensuring that all of the writing addresses the task.
- Organization:** Using headings and sub-headings, writing logically and with useful transitions.
- Content:** Ensuring that all content is relevant, and supported with suitable examples.
- Readability:** Checking for topic sentences and the clarity and conciseness of the writing.
- Academic standards:** Following academic standards for referring to other people's writing.
- Proofreading:** Helping the student to check that the writing is free from minor errors.

A draft = a first attempt at a piece of writing.

Consulting a peer tutor will lead to a greatly improved second or final draft of writing.

C. Brandt, February 2011

Faculty News

Physics Department Retirements

The Physics Department had to say farewell to two of its faculty this spring: after long service, both Professor Mike Stokes and Assistant Professor Marinus Dirks retired. Dr. Stokes joined the PI in 2005 bringing substantial teaching, research, and leadership experience. In addition to his role as a popular teacher, Dr. Stokes also served as an Assistant Dean of the College of Arts & Science and participated in numerous college-level and university-level committees. Dr. Marinus Dirks joined the PI in 2001 and also brought substantial teaching and technical experience. Credit goes to Dr. Dirks for quickly establishing and then providing oversight for the PI's introductory Physics laboratories. The Physics Department wishes to express its ap-

preciation to both Dr. Stokes and Dr. Dirks for their substantial contributions to the PI. We wish them well in retirement.

Chemistry

The Chemistry Department lost one of its long-serving members, Dr. Jens Eriksen, at the beginning of 2011. Jens had been part of the chemistry group since Fall 2005, and had taught all of the chemistry courses, with the exception of Physical Chemistry, during his years at the PI. However, Jens' main contribution was to the Organic Chemistry program and this is where we shall most miss his skill, enthusiasm and wry humour.

Jens will also be remembered throughout the university for the marvelous photographs of birds and wildlife that he and his wife Hanne have taken during their many years in the Gulf region. Many offices at the PI were (and possibly still are) adorned with the famous "Bird Cal-

endar" that they produced each year, and Jens was a frequent participant in photography activities at the PI. Indeed, it is to devote more time on his "hobby" of photography that Jens has finally hung up his lab-coat.

The Chemistry Department thanks Jens for his many valuable contributions to the group and wishes both him and Hanne every happiness and success for the future.



Communication

The Communication Department said a fond farewell to Dr. Sivakumar Sivasubramaniam in June. Siva made a tremendous contribution to teaching, research and scholarship during the three years he was with us and will be greatly missed by colleagues and students. We wish him equal success in his new post in South Africa.

New Faculty



The General Services Department welcomed Dr. Sam Cubero at the beginning of fall semester 2010. Dr. Cubero has his Ph.D in Mechatronic Engineering

from the University of Southern Queensland, where he also lectured before coming to the Petroleum Institute. Dr. Cubero's areas of expertise include mechatronics, computer control, programming, microcontrollers, electronics, mobile robots, robotic manipulators, walking machines, flying robots (UAVs), machine vision (object & shape recognition) programming, design and manufacturing. The GSD, and the STEPS team in particular, welcome Dr. Cubero to the PI.

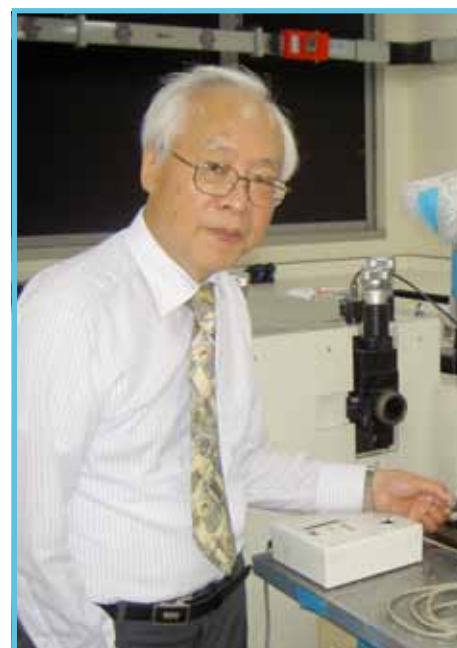
Research

Physics Research on Superconductivity to be Conducted at the PI

A new research program has been initiated in the Physics Department by Visiting Professor Shunji Sugai. Professor Sugai, in collaboration with Professor Kofi Agyeman and Associate Professor Abdellatif Bouchalkha, propose to investigate potential applications of Superconducting Quantum Interference Devices (SQUIDs) for geophysics and energy-sector applications. The basic idea is that SQUIDs are about 1000 times more sensitive to magnetic fields than conventional detectors. Given this sensitivity, a SQUID can resolve tiny changes in magnetic fields. An example application may be to use this sensitivity to detect and/or locate pipe defects or leaks. This same sensitivity could also allow the detection of small changes in ground resistivity and so provide useful data to geophysicists in the oil and gas industry.

Professor Sugai's substantial professional and technical experience will help the project get off to a quick start. Dr. Sugai is an expert in Raman Scattering and Superconductivity. He comes to the PI from the Physics Department of Nagoya University in Japan, and before that from Osaka University. In Osaka, Dr. Sugai began his research in Raman Scattering soon after lasers first became available. In the early days, he developed techniques for dealing with a basic challenge in Raman research - the very small amounts of Raman-effect light that is produced. In Raman scattering, the light is so weak that experiments typically must depend on single-photon light detection. Later, Dr. Sugai applied Raman scattering to the detection of specific atomic vibrations. Using Raman techniques, Dr. Sugai has studied the softening of atomic

vibrations at structural phase transitions, electronic excitations in solids, and the dramatic changes in electronic states in superconducting transitions. His Raman scattering studies with superconductors have led to insights about the role of anti-ferromagnetic excitations in superconductivity. More recently he has studied self-organized, non-uniform, nanostructures of spins and charges in high-temperature superconductors. While some researchers believe these structures contribute to superconductivity, their role is hard to study since they are very difficult to detect. Dr. Sugai is applying his Raman scattering techniques to deal with this challenge.



Professor Sugai in the new physics research lab on campus

Chemistry

The Chemistry Department has continued its research activities throughout 2010 and 2011. A brief overview of some of their activities is given below:

Degradation studies of concrete, PI Research Initiation Grant (RAGS), Avin Pillay (PI), Mirella Elkadi (Co-PI), Ghada Bassioni (CHE), S.C. Fok (ME),

duration: Jan 10-Dec 11, AED 222,000.

Development of an application to evaluate the durability of concrete following the invasive migration of chloride/metal ions is of considerable importance in the oil and gas industry as degradation of concrete structures can seriously hinder certain operations and profitability. The present work is of interest both to materials and environmental research, and in mechanistic studies on aggregates. The purpose of this project is to assist ADNOC in this area through the development of novel techniques to evaluate durability and degradation of concrete.

Biofuels studies, PI Research Initiation Grant (RAGS), Avin Pillay (PI), Mirella Elkadi, S.C. Fok (ME), duration: Jan 10-Dec 11, AED 350,000.

This research has succeeded in generating small quantities of biodiesel from non-edible neem feedstock, found in the UAE (see pictures below). The goal of the biofuels team is to explore biofuel production from various non-edible plant species in the UAE, and they have started work on a small scale using neem. Although the neem tree is popular (growing all over the UAE), the production of biodiesel from oil obtained from its fruit and kernels is surprisingly underexplored as the yield is modest. However, in the current study the researchers are trying to find ways to overcome this barrier. They are also planning to extend their research to other non-edible feedstocks in the UAE, such as algae and desert flora.

The biofuels team is made up of Drs. Pillay, Elkadi and Fok as well as research assistants Johnson Manuel, Mohammed Zubair Khan, and Sasi Stephen.



Neem feedstock

Neem biodiesel

The Communication Department Research Seminars 2010-2011

The Communications Department started a series of research seminars in September 2010 for faculty to share and brainstorm ideas within the field of language learning, linguistics and related matters. Faculty from the Advanced University Placement Programme (AUP) were also invited to participate. Mary Hatakka, a Communications instructor, was nominated to facilitate the seminars.

During the first seminar in October 2011 participants gave brief descriptions of the type of research they were focusing on during the academic year with research interests ranging from pyramid methods to teamwork, testing, collaborative teaching, student voice and student engagement. Most of the participants already have a PhD, but there were also participants discussing their ongoing doctoral and Master's level thesis. The second seminar was held two months later and mainly focused on Asli Hassan's doctoral thesis on collaboration among English, Physics, Maths and Computing faculty teaching in the AUP programme and an integrated approach to learning. Then Constance Eide elaborated on her Master's thesis on teamwork among faculty and types of existing underlying patterns involved. Mary Hatakka's doctoral thesis was also discussed and she is focusing on ways to improve PI students' academic achievement by analyzing their academic literacy skills and the type of engagement they demonstrate in a classroom setting. The main focus of the final seminar was David Dalton's research interest in the way teams function when the members are Emiratis. The discussion revolved around the possible differences with regard to students and faculty about concepts such as team and task, appointing leaders, emotional reactions to teamwork and efficient ways to collect data on such research.

There were three seminars in the academic year 2010-2011 attended by some ten instructors, both from Communications and from AUP. Brainstorming ideas and receiving feedback from colleagues was seen as a very useful way to improve on ideas and rationale in the participants' research.

Events

Professor John Billingsley (from USQ Australia) spent one week at the PI, discussing research activities and plans for the development of the TURTLE robot with Dr. Sam Cubero and Dr. Jaby Mohammed. Professor Billingsley pre-

sented a 1-hour video seminar describing several interesting walking and mobile robots he had developed, including several different machine vision systems currently being used in industry for detection, classification, control and quality inspection work.



Dr. John Billingsley

Dr. Sam Cubero and Dr. Jaby Mohammed are working on PROJECT TURTLE, which involves analyzing and investigating the feasibility of building a 6-legged walking robot with oscillating foil propulsion capabilities. Basically, rotatable fins (foils) will be added to the shins or lower limbs of 6 three-degree-of-freedom walking legs, and will be controlled for achieving omni-directional swimming capabilities in water. Oscillating foil propulsion uses only about half as much energy as rotating propeller blades, while producing the same propulsion forces in one direction. The walking TURTLE (Teleoperated Underwater Robot for Transporting Lightweight Equipment) will be remote controlled via acoustic modem and will follow all the movement directions issue by a remote operator who will be receiving live streaming video data and sensor information on a laptop PC. At present, the full conceptual design has been finalized and detailed manufacturing plans are being developed.

Research News

Dr. Ryan Fernandes has continued research collaborations with Dr. Graeme Fairweather, who is currently Executive Editor for Mathematical Reviews at Michigan, U.S.A., and Dr. Bernard Bialecki, Professor at Department of Mathematical and Computer Sciences, Colorado School of Mines, U.S.A. The three of them have a joint paper entitled "Alternating Direction Implicit Orthogonal Spline Methods for Evolution Equations" which was presented by Dr. Fairweather at the Mathematical Modelling and applications to Industrial Problems (MMIP) conference organized as part of the golden jubilee celebrations

by the National Institute of Technology in Calicut, India, March 28 – 31, 2011.

Dr. Fernandes has another joint research work with Dr. Fairweather in which they apply the Alternating Direction Implicit Orthogonal Spline Collocation (ADI OSC) technique to reaction diffusion systems which have been referred to in the literature as the Brusselator model, the Gray-Scott model, the Gierer-Meinhardt model and the Schnakenberg model. This work was presented by Dr. Fairweather at the AMS meeting held at University of Nevada, U.S.A., April 30 – May 1, 2011 and will soon be submitted to the Journal of Computational Physics for publication.

Dr. Fernandes and Dr. Bialecki are pursuing extension of their earlier work on using the ADI OSC technique for solving nonlinear problems. New results demonstrating how the ADI OSC method can be applied to non-rectangular domains were presented by Dr. Bialecki at the conference on Computational Complex Analysis and Approximation Theory held in Protaras, Cyprus, June 5 – 11, 2011. This generalization is an important step in the development as it opens the doors to researchers in various fields enabling them to use this technique for solving various problems efficiently in arbitrary domains.

Dr. Amjad Tuffaha has been working on a PI-sponsored research project dealing with the analysis and control of fluid-structure interaction. The project involves studying different important nonlinear models of fluid-structure interaction that describe the interaction between fluid flows and solid structures. The problems under investigation are:

1. A comprehensive analysis of free boundary problems involving the interaction of viscous both incompressible and compressible flows and elastic materials and a numerical simulation of the model.
 2. A study of fluid-structure interaction problems in porous media and thin domains with its applications to oil reservoir modeling and flow in pipes and lakes.
 3. Development of an optimal control theoretic framework addressing boundary control of parabolic-hyperbolic coupled PDEs.
 4. Optimal control of fluid-structure interaction phenomena via boundary and point boundary controls with an extension to the case of viscoelastic fluids.
 5. Application of fluid-structure Interaction analysis and control to problems in aeroelasticity.
- Other collaborators involved in the project are Igor Kukavica from the University of Southern California and A.V. Balakrishnan from the University of California in Los Angeles.

Dr. Jyotshana Prajapat has been working on a project involving the analysis and modeling of controlled-source electromagnetic methods for shallow water. This forms part of the geophysical technologies in carbonates R&D ADNOC project.

Significant Presentations

Dr. Alip Mohammed participated in the 8th ISAAC congress at the People's Friendship University of Russia in Moscow, August 22-27, 2011 and gave a talk entitled "The Bitsadze equation for the third boundary condition with holomorphic coefficient".

Dr. Jaby Mohammed presented his research on Direct Metal Deposition at the Workshop on New Frontiers on Material Science and Technology in Kuwait city, Kuwait. He is continuing his research in modeling the alloy composition using the goal programming technique and trying to compare the results with the empirical research that has been done.

Dr. Mohammed also presented a paper entitled, "Lean Value Stream Manufacturing for Sustainability" at the 8th global conference on sustainable manufacturing at Masdar University in Abu Dhabi.

Dr. Abdullah al-Shami attended two conferences, in Jeddah and in Malta, at which he gave keynote addresses on the subject of Islamic business and finance.

Dr. Mashhad Al-Allaf was a principal speaker at a conference in Aix-en-Provence, France, where he addressed the question "Should we renew our Moral Philosophy for the ever-renewed technology?"

Humanities and Social Sciences

In April, the PI hosted an international symposium on Engineering Ethics, the first of its kind in the region. It was conceived and organized by Dr. Mashhad Al-Allaf, with the full support of the Provost and the Dean of the College of Arts and Sciences. The event took place on both men's and women's campuses, its main aim being to raise students' awareness of the moral responsibilities of engineers. Six distinguished speakers gave lectures over two days, and the event concluded with a panel discussion. It formed part of an Ethics Awareness week, during which students created posters, short movies and brochures.

The symposium explored Engineering Ethics in three distinct areas: society; academia; and industrial practice. Amongst the topics discussed

were responsible engineering, engineering ethics and conflicts of interest, and an anthropological perspective on engineering ethics. The event was well attended, the lectures well received and the level of student interest and participation was high. Students took part in workshops and in question and answer sessions. As Dr. Al-Allaf remarked, "Students gained critical thinking skills and were allowed the opportunity to voice their own perspectives regarding ethical cases." It is hoped that PI will host this event annually.



Dr. Mashhad Al-Allaf with key-note speakers



Dr. Ismael Tag attends the symposium

Chemistry

In October 2010 Dr. Mirella Elkadi and Mr. Sasi Stephen attended the 1st UAEU (United Arab Emirates University) Chemistry Symposium on "Chemistry and the Environment", organized by the Chemistry Department at UAEU. They presented a poster entitled: "Environmental Effects of Toxic Metals in Concrete: An ICP-MS Study." Drs. A.E. Pillay, S.C. Fok, F. Feghali and G. Bassioni were co-authors on the paper.



Dr. Mirella Elkadi with Mr. Sasi Stephen

Dr. Elkadi was also invited to participate in the Supreme Petroleum Council (Crisis Management Section) Petroleum Industry for Engineers course, organized by ADNOC Technical Institute (ATI). As a guest speaker, she delivered a lecture on 'Hydrocarbon Chemistry' on March 16th to about 25 highly motivated students of various nationalities.



Mr. Mohammed S. Al Qubaisi presenting a certificate of appreciation to Dr. Mirella Elkadi at the ADNOC Technical Institute.



Dr. Mirella Elkadi with ATI students

Dr. Mirella Elkadi (Chemistry) received the "Faculty Service Award for 2010" at the End of Year Dinner, held on June 5th 2011. The award recognizes her many contributions to the PI during the past year.



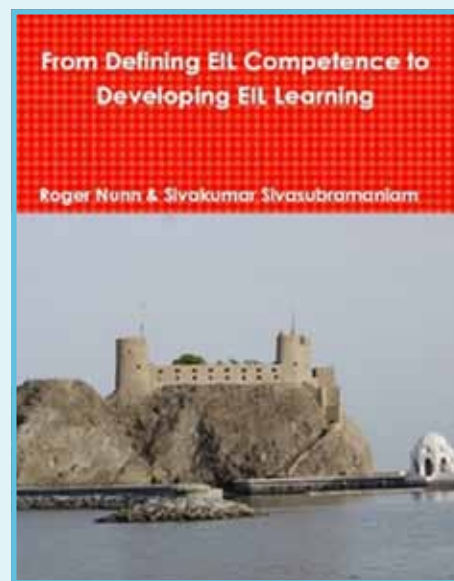
Dr. Mirella Elkadi receiving her Faculty Service Award for 2010

Awards & Achievements

Dr. Jaby Mohammed (STEPS) was awarded the William Everett Warner Professional Practice Award from Epsilon Pi Tau for the year 2010.



Dr. Jaby Mohammed



In July 2011 Roger Nunn and Sivakumar Sivasubramaniam published a new book supported by the English as an International Language Journal and the Asian EFL Press, "From Defining EIL Competence to Designing EIL Learning". The book draws extensively on PI-funded research. It was launched at the Asian EFL Journal Conference in Cebu in August. Copies are available in the PI libraries.

Roger and Siva also gave a well-received international conference presentation with 3 undergraduate students, Yasmine Guefrachi, Hadeel

Al Shami and Ayesha Tariq using findings from their PI-funded research project into academic competence in the PI - "Researching Competent Writing with Competent Students: Student Empowerment (as students, tutors & researchers)" at the MENAWCA Conference which took place this year at the American University of Sharjah on February 18 2011. Roger and Siva report receiving very positive feedback about the students' contribution to the presentation – and their ability to discuss and respond to questions on quite complex systemic linguistic aspects of transitivity - "as teachers we were (of course!) delighted to see them outshine their instructors".

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