

IOPWE Newsletter – 2005

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About IOPWE

This newsletter marks 10 years of IOPWE. It serves as a great introduction to the organization, its members and the aspirations and goals of accomplished women technologists, engineers, scientists and businesswomen. These women are making difference in the lives of corporations all over the world. IOPWE is proud to provide a platform to the women in business, engineering, sciences and technology and plan to grow with the participation of highly motivated and active women.

Events

- IOPWE co-sponsored an event with Ekta for earthquake victims
- IOPWE organized an all day career development workshop at San Jose State University, California. The organization invited entrepreneurs, CEOs and top managers of Pakistani and Indian origin from well-known Bay Area companies.
- IOPWE met the Pakistani MOST (Ministry of Science & Technology) minister and his visiting team to the Bay Area twice and gave them a presentation on women and technology and the role that the ministry can play in encouraging more women in engineering in Pakistan.
- These meetings led to a career event in Islamabad organized by IOPWE and the ministry of S&T. Over 400 girls and educators from various institutions in Islamabad and Rawalpindi attended. The Islamabad group gave a talk at a local school regarding careers for women in engineering.
- In March 2004 IOPWE Co-sponsored a South Asian film festival raising awareness of women's issues.
- In April 2004 IOPWE organized a professional speaker event E2VC and fundraiser and managed to raise \$1600.
- In April 2004 IOPWE was featured on Jaiza - a talk show broadcast on GEO TV.
- In June 2004 IOPWE co-sponsored an event at OPEN Forum by organizing a panel comprising executives from Agilent, TEL Labs etc.
- Local mailing lists for different regions in Pakistan were established with the recent addition in 2006 for IOPWE *Peshawar Chapter*.
- With the help of local members IOPWE formed the *Karachi Chapter* led by its executive team

Programs

- In 1997-1998, IOPWE developed its formal networking structure. The membership was anywhere over 100 members all over the world. IOPWE bulletin boards and mailing list was developed to introduce members and discuss issues related to women in engineering.
- In 1999, Local gatherings/seminars were arranged on the East Coast to discuss issues related to professional women from Pakistani origin. The veterans shared their perspectives and priorities in life. The younger lot listened and discussed their take on issues important to them.
- In 2002, IOPWE formally launched the scholarship program for high school and college women studying engineering.
- The IOPWE mentoring program was launched in January 2004 with the help of board member Shehla Mushtaq and Erum Frahim. This program has proved to be a key forum for all lot of members to ask important education and career related questions.
- IOPWE organized a summer long joint program with the Mid peninsula YMCA in Palo Alto. IOPWE members presented topics related to engineering as a career targeting middle school girls.
- IOPWE held its first formal fundraiser event.

- In 2004, in the Bay Area, IOPWE was featured on local TV program called Bay Area Women where Risa and Nabiha talked about IOPWE's vision for women and engineering. IOPWE sponsored the first scholarship within the US amounting to \$3000 to a deserving candidate pursuing her engineering degree.

Significant IOPWE Event

- In December 2004 the US Federal Exempt status 501 (C) 3 was granted to IOPWE, making all donations made to the organization tax deductible. This has been a major milestone for the organization.

IOPWE's Past Leadership (in descending order)

- Nabhia Maiyyudi
- Risa Altaf
- Zahra Jamshed

Profile - IOPWE President -Hina Naqvi (2005 – Present)



Born and raised in Pakistan, Hina moved to the California-Bay Area after finishing high school in Pakistan. She has a B.Sc. in Computer Science from California Polytechnic University, San Luis Obispo. Prior to graduation, she interned at Stanford Research Institute and Adobe Systems Inc. Hina has been working at Adobe for the past six years as a software developer. She has been associated with many non-profit organizations for the past ten years, IOPWE, Society of Women Engineers (SWE), and YMCA to name a few. Her interests include traveling to different parts of the world, watching movies, and outdoor activities. Hina can be reached at hinanaqvi@hotmail.com.

News from Karachi Chapter



- 1) Jehan Ara, President of PASHA giving an opening speech in Job Fair
- 2) Rabia Azfar President Karachi Chapter, attending visitors on IOPWE stall



3. Sophia Husnain, Secretary Karachi Chapter and Rabia at the IOPWE stall.
4. Provincial IT Minister visiting IOPWE stall and shown keen interest on doing joint projects.

Changing Lanes: The Hard Way by Farhana Sheikh



Pursue your dreams passionately. If there is one thing I have learned over the past five years is that a persistent pursuit of dreams and goals can make you the happiest person in the world. In August 2001, I switched out of the fast lane of senior management and took the exit to graduate school to pursue a life long dream of obtaining my PhD in electrical engineering. The road to graduation has been, and still is, bumpy yet scenic. It has taught me to thoroughly enjoy the good moments and persevere through the tough times.

I am now a couple of years away from graduation, and it has taken me almost more than double the time I thought it would to complete my PhD. However, I am sure that on graduation day I will be the happiest I have ever been in my life. One of life's best-kept secrets is that hardship can make you a much stronger person, so welcome it

instead of fearing it.

My troubles started at the very early stage of my return to graduate school. After five successful years of software development and management in an electronic design automation startup, my return to graduate school was anything but stellar. I started off by failing my preliminary exam and thinking that I would have to return home to Canada. However, God was kind and I got another chance. I passed and then thought I was on my way to a successful career in graduate school. However a few months later, I found out my advisor no longer had money to support my research and I was left with a decision: find another project, find another advisor and project, or give up and go home.

My stubborn nature got the better of me and I eventually made a deal with a new professor in digital circuit design to take me on as a student. He agreed reluctantly as I had little or no experience in digital circuit design. I was a willing student with nothing to lose and very naïve about how long PhDs in circuit design take when there is little prior knowledge. So I took undergraduate classes and graduate classes and finally latched onto a good research project under the guidance of my new and amazingly nice advisor.

Since 2003, things have been improving slowly even though the adjustment has been extremely difficult. I have completed all my class work and am preparing for the qualifying exam, which will lead into the final phase of my PhD: the dissertation. In 2005, I received an Intel Foundation Fellowship to support my research and am now working part-time at Intel as well. Finally, there is light at the end of the tunnel.

In all of this, there has been one underlying theme in my personal development. Never think that a dream is too outlandish or impossible to pursue. Perseverance and hard work can overcome any difficulty. If it can be done with a welcoming smile, then the reward is even greater. Life was easy prior to August 2001; but now it is challenging and much more fun. These days I am more content than I have ever been because I know that I am on my way to accomplishing my dream.

About the author: *Farhana Sheikh is the founder of IOPWE. She is a graduate student at the Department of Electrical Engineering and Computer Sciences at the University of California, Berkeley. Her PhD research is focused on low-power digital circuit design methods for application specific integrated circuits. She is now working part-time as a graduate student intern at Intel Corporation, and is a recipient of the Intel Foundation PhD Fellowship. Her other research interests include developing business models for health care delivery over IP to rural villages in developing countries. Farhana can be reached at f.sheikh@iopwe.org.*

Why? By Zahra Jamshed



It's been almost 5 years since I have shared my thoughts with IOPWE members. Despite my personal and professional commitments, I have stayed in touch with the organization and its activities through the mailing list. During the 3rd quarter of 2005, I attended an interesting seminar on "Change" for South Asian Women in Chicago that made me revisit IOPWE as an active contributor. The following is a philosophy in life that I have held close to my heart. If you truly believe in making a change, you have to be fully committed to that. You cannot make half-hearted efforts. Such efforts do not add much to you or to your desire of making that change. As Gandhi said, "If you want to make a change, then be the change yourself."

There were 100 participants attending the jam-packed conference hall at Northwestern University in Chicago. In that crowd, fewer than 10% were of Pakistani background. In my personal life, I know more than 10 successful professional women of Pakistani origin. Some of them are family members, close friends from college and university days in Pakistan/US, whereas others are professional colleagues who I have come across during my consulting career. As the conference continued, I wondered why we don't have a stronger representation of Pakistani American Women in such symposiums?

Ambereen Mirza, Pakistani Ambassador at Indus Women leaders (IWL) made the same observation -- a lack of participation and initiative in professional networking groups among the women of Pakistani origin. She noted that 10% of attendees at IWL in Boston, and maybe as low as 5% of the attendees of OPEN in Boston, are Pakistani women. We have a lot of successful women having impact in business, engineering and technology, but when it comes to women taking an active role in professional organizations, there is a lot of room for improvement. These professional organizations are not a waste of time. They keep you informed about the industry trends and provide you with an opportunity to network with other like-minded professionals. In 2006 let's make sure that IOPWE Members in the US continue to develop themselves by participation and leadership in various initiatives in business and technology-related professional organizations. Keeping that thought in mind, I recommend looking into the following organizations:

- WITI - Women in Technology International www.witi.org
- Forte Foundation - www.fortefoundation.org
- IWL - Indus Women Leaders www.induswomenleaders.org
- PMI - Project Management Association www.pmi.org
- AWIB - Asian Women in Business www.awib.org
- NYSIA - The New York Software Industry Association www.nysia.org
- SWLF - South Asian Women Leadership Forum www.southasianwomen.org
- OPEN – Organization of Pakistani Entrepreneurs in North America www.open-us.org

About the author: *Zahra Jamshed is a senior project manager with a technology consulting firm in NYC. Zahra has over 10 years of professional experience in management and technology consulting with financial services, insurance, pharmaceutical and public sector clients in the US. Her area of expertise includes project management and business process optimization. Zahra has an M.S in Computer Information Systems from University of Detroit and a B.S. in Chemical Engineering from UET, Lahore, Pakistan. Zahra has attended several executive leadership and project management training programs. She is active in various professional organizations. She was the key speaker at one of the WITI, NJ Events in 2005 and also a winner of Robert Steenrod Award by PMI-Financial Services SIG in 2004. Currently she is exploring the six-sigma courses and plans to pursue green belt and ultimately black belt certifications. Zahra can be reached at zjamshed@msn.com for IOPWE-2005 Newsletter feedback and East Coast IOPWE alliance partnerships.*

From UET to Alaska By David Khan



When I came to Alaska in 1982 as a graduate student, I already had a bachelor degree in Mining Engineering from the UET. The initial idea was to complete the education and go back to Pakistan. Meanwhile, I met a beautiful young woman, fell in love, dated her, and then got married.

Soon I found out that married life, when you are a graduate student, is just hard. I was studying day and night to keep up my GPA. Several nights per week were spent in the laboratory working as a research assistant. I could remember typing away my reports until morning and keeping my wife awake with the tick tick noise of the keyboard not realizing that I was

hurting my marriage. Well, the strain of graduate work, lack of money, and loss of attention to my wife took the toll and she asked for divorce. I wanted to stay married to her and started to spend more time with but it was just too late: water was under the bridge and my marriage was on the rocks. While I was still in college, I not only got married but also got divorced.

Those were the sad days when I was going through the motions of divorce. I was devastated. During that time of pain and suffering, when I could not even talk to my strange wife and did not want to talk to others about my pain either, I would take long walks around the campus of the University of Alaska at Fairbanks (UAF) contemplating about my life and future. It was during these walks and self talks, I started to like the frozen mornings, northern lights, and quite snow that fell on campus roads. When came summer, I took more walks and watched birds migrating north. I started to like Alaska – the great land who spoke to me quietly when I was introvert and wished not to speak with anyone. Alaska was the place where I learned that joy is a great teacher, but so is pain; laughter is great teacher, but so is sadness. This was the beginning of my new life in the frozen land where I experienced the teaching power of diverse emotions and extreme weather.



After completing my MBA, I obtained a second bachelor degree in Mechanical Engineering with emphasis on Environmental Engineering. I worked with the British Petroleum Exploration (Alaska) in its Environmental and Regulatory Affairs program bringing gas turbines and diesel engines into the EPA air-quality regulatory requirements. Soon I was traveling to Prudhoe Bay and Barrow Alaska – the northern end of the earth. Prudhoe Bay and Barrow are the human communities you can go as far north as you possibly could in the North America barring some military installations. There, in the Arctic Plains I saw wild herds of Caribou roaming free in the tree less Tundra. Later, I accepted an Environmental Engineer position with the Drinking Water Program of the State of Alaska. In 1999, I passed the State of Alaska Board of Engineers examination and obtained my Professional Engineer license as a Civil Engineer. During all this, I met my wife Dianna and have two beautiful daughters with her – Chrystalina (14) & Adriana (9).

My professional work mostly deals with approving and denying engineering plans submitted by private engineers for the construction and modification of drinking water systems. This involves understanding of fluid mechanics, strength of materials, chemistry, biology, and mathematics. The UET prepared me well for all of my engineering challenges. Any time, I work on a fluid mechanics problem; I cannot help but think of Fluid Mechanics class I took at the Annexe Block of the UET. For one reason or the other, the UET has been and will be a large part of my life.

Last year, I visited Pakistan and UET. To give something back to Pakistan and UET, I started a website <http://www.engineeringuniversitylahorepakistan.com> for the UET Endowment Fund to which I have donated \$100. Moreover, I started a Rs. 500 per month scholarship for my neighborhood kids in Dharampura Lahore where I grew up. My next plan is to start another Rs.500 per month scholarship for the old Lahore Municipal



Corporation Primary School where I went to complete my 5th grade. Additionally, I have been active in raising funds for the recent earthquake victims.

I am happy with my life and profession knowing that I am not only enjoying my life but also making a small positive difference for Pakistanis.

I encourage the adventurous UETians to come to Alaska for visit, education, and work. Alaska, a land of many contrasts, presents unique opportunities to engineers and other professionals. As I mentioned earlier, I came to Alaska back in 1982 to attend University of Alaska Fairbanks. After finishing up my education, I started to

work in the field of Environmental Engineering, first with the British Petroleum Exploration which owns large swath of oil and gas fields in Prudhoe Bay and then with the State of Alaska's department of Environmental Conservation which governs the environmental issues in Alaska. Currently I am an Environmental Engineer with the Drinking Water Program.

If you are interested in coming to Alaska for a pleasure visit, education, or employment and have questions, you are more than welcome to contact me on (907) 465-5317 or (907) 790-1950.

About the author: *David Khan is an Environmental Engineer with the State of Alaska.*

International Conference: South Asian Women's Health by Nusrat Naqvi



During the Thanksgiving holidays this year, November 24-26, 2005, the Imamia Medics International (IMI) held its tenth annual and third international conference in Edison, NJ at the Pines Manor Conference Center.

This three-day conference included a professional medical (4CME accredited) component on the health of South Asian women presenting topics such as: "Understanding menopause and hormone replacement therapy: A balancing act"; "Oral health issues of Asian Women"; "Cardiovascular Diseases with modifiable risk factors"; "HIV/AIDS and South East Asian women"; and "Obesity and Metabolic Syndrome among Asian Americans". Outstanding Speakers from diverse

backgrounds and expertise were invited.

The second major component focused on Women's health, well being, and family structure. Three presentations by a cardiologist, a pediatrician, and a psychologist were followed by three concurrent workshops. The workshops dealt with challenges of motherhood in the western society, issues and challenges of young professional women, and new Muslim women. These workshops were very engaging for both men and women and generated a lot of discussion.

IMI has been a NGO of United Nations since 2001. One of the components of this conference was a seminar entitled: "Disaster Management: A Tremendous Community Need". Speakers highlighted UN strategies for disaster management, recent South Asian Earthquake devastations and relief efforts. A discussion followed, focusing on how to best manage such catastrophes in the future in a proactive manner.

An afternoon event, a "Mushaira", presented internationally acclaimed poet Iftikhar Arif from Pakistan among many others who came from various parts of USA and enlightened the audience.

A poster session recognizing three top awards; a General Body meeting to capture feedback from the membership; a photo exhibition to highlight the events of the past year; and booths and stalls to showcase cutting edge medical businesses were other attractions of this conference. On the third day, a tour was organized in the morning to visit the Get Well Clinic in NJ; a free community service donated to serve the uninsured and underinsured community members by resident physicians of the organization. In the afternoon, the conference delegates were treated to lunch at a local Imambargah and a short religious session was observed. In the evening, the delegates took a bus tour to New York City.

Three days of education, awareness, interaction, and entertainment offered delegates a varied experience. There was a babysitting arrangement for the very young. Ethnic cuisine of top quality was served at all meals, the Thanksgiving lunch being the most exquisite of all. Among the keynote speakers were the Malcolm Baldrige Presidential award winner, Christy Stephenson, President and CEO of Robert Wood Johnson University Hospital, Hamilton, NJ; Xiaoyu Wang, Political Affairs officer in the department of Disarmament Affairs of United Nations; Senator Upendra J. Chivukula, NJ; and Seema Singh, NJ ratepayer advocate.

IMI was incorporated in April 1994 in New York. It is managed by a 5-member Board of Regents and a 10-member Board of Directors. There are three Ph.D. and 12 M.D. members on the two boards. Nusrat H. Naqvi, Ph.D., the only female in managing boards is the coordinator of the Board of Regents and the current Global President of the organization. The major focus of this organization is community service by health care and education. There are many IMI chapters working in US and worldwide.

For additional information, please contact the president Dr. Nusrat H. Naqvi at nhnaqvi@aol.com or check the web site at www.ImamiaMedics.org

“I hate feminists” – A Canadian Tragedy by Zahra Khan

Recent discussions on the IOPWE mailing list have seen submissions from women engineers concerned about their male colleagues' attitudes towards them, particularly when women seem to be performing better than their male counterparts. We have especially heard concerns from women based in Pakistan. For the Pakistani readers especially, therefore, I'd like to highlight some history of this issue in North America and ask you to join me in remembering the events of Dec. 6th, 1989: a day that changed the landscape of Canadian engineering. Classes were taking place as usual that day near the end of the semester at Ecole Polytechnique in Montreal, when a young man named Marc Lepine walked into an engineering classroom, separated out the women and shot all women in the room screaming "I hate feminists". He roamed around the hallways shooting a few more women before committing suicide. The motive behind Lepine's atrocious acts was said to be the rejection of his application for admission to Ecole Polytechnique, which he blamed on feminism. He was outraged that women were allowed to attend the university while he was denied admission. The real reason for his rejection was incomplete prerequisites.

If there can be a bright side to such a horrendous affair, it was simply this: Marc Lepine failed in his mission to make a statement against feminism. Rather, his act took the cause of feminism even further. The waves of outrage that spread in the country in response to the events of Dec. 6th, 1989 resulted in a tremendous increase in enrollment of women in engineering programs: allegedly from 5 % in 1989 to 20 % in 1990. Also since that time, Canada has put in place several programs to help women already in the field while encouraging young girls to consider careers in engineering. These programs included endowed "Women in Engineering" chairs at major universities across the country, affirmative action programs providing employment to brilliant female engineering students in prestigious government research labs and support of "camps" designed to interest girls in science and engineering.

As we have seen, sixteen years on, some people's attitudes towards women in engineering are still not favorable. I hope you will join me in pledging to change this situation. As a minority in the engineering field, I feel it is our responsibility to encourage young girls as well as their parents to see engineering as a future career to which they can make a valuable contribution. Simple ideas for outreach include presenting a talk about your work at a local school or inviting children to your workplace for a tour. We also have to take the problem by the horns with regards to the general public's attitude towards women in engineering. Some ideas for this include asking magazines and newspapers to publish articles about successful women engineers, encouraging women's organizations to invite women engineers as speakers to their events and organizing an event to honor the contributions of women engineers to your community. Finally, I'd also like to ask you to please join me in praying for a bright future for women in the field of engineering free from events like those of Dec. 6th, 1989.

Sources:

Canadian Broadcasting Corporation Archives: http://archives.cbc.ca/IDD-1-70/98/disasters_tragedies/montreal_massacre/

Wikipedia: http://en.wikipedia.org/wiki/Montreal_massacre

Talks at the Conference on Women in Engineering 2002.

About the author: *Zahra is a recent graduate in Aerospace Engineering from Carleton University, Ottawa, Canada*

Notes from an Oilfield Diary by Tauseef Salma



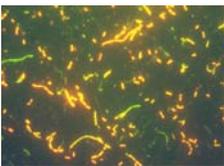
Being the fourth child of eight kids, I grew up to be rather risk-averse. Yet after twenty-three years of relatively sheltered life, leaving Pakistan to pursue a doctorate in chemical engineering did not seem particularly daunting. I was just too keen to explore the world and expand my knowledge.

After one year of hell in Houston, I finally settled into my new environment and started working on my research to study kinetics of oil breakdown by genetically engineered bacteria – to clean oil spills. In 1996, the fourth year of my graduate school, I was busy formalizing my kinetic model when I met my first professional mentor, Dr. Jim Lawson. Jim joined our research group as a Staff Scientist after retiring from Shell Oil with thirty years of service in oilfield chemistry.

Following multiple stimulating discussions with Jim, on the technical challenges in the production of oil and gas, I decided to take several courses on reservoir engineering. In 1997, after successfully defending my thesis on enhanced biodegradation of oil, targeted to remediate spills, I decided to make a hundred and eighty on my technical focus. So, instead of going into environmental remediation, I ventured on my quest for efficient production of oil.



In November of 1997, I found myself navigating the “hollers” of West Virginia during the second week into my first industry job. Having lived my entire life in a very temperate climate above 70°F for most of the year, temperatures below 30°F extended a chilly greeting at the airport. I could feel the brittleness in my bones before we got to the rental car covered with fresh snow. I maintained my composure and confidently told my colleague, Mike, that I can sustain the cold – as I had equipped myself with an assortment of thermal accessories and a huge parka designed for extreme outdoors.



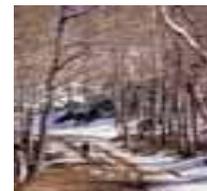
Next day we left the hotel at 6:00 a.m. while it was still dark outside. My supervisor had alerted me that starting times in the oilfield are pretty early. However, nobody told me that the phrase - *Hurry! Hurry! And Wait ...* was

coined specifically for oilfield related services. I was instructed to follow my colleague's truck (a 4x4 Ford F250) in my sporty Pontiac Grand AM. All bundled up, ready to explore the oilfield to conduct my engineering survey, I zealously got into the car and started my journey.

After a short trek on Interstate 81, we took a turn onto a farm road and pretty soon it gave way to a dirt road. Five minutes later, the dirt road was missing and I found myself in front of a big mud patch. Luckily, I anticipated trouble just in time and tried to get attention of my colleague who was several yards ahead of me. All I saw were the rear end lights of the truck moving away from me through the heavy fog.



My rising anxiety level alerted me to the existence of the car horn, which I had not used in a long while since I had learnt to drive in the US three years ago. My hands released the horn button as the break lights from the truck peeked through the fog. After what seemed a long time, Mike appeared in sight and motioned me to reverse and park the car to the right side and walk up the hill to the truck so all three could ride together.



Thirty minutes later, driving at 5 mph, we made it to the chemical injection location at the wellhead. With no processing equipment in sight, I could barely hide my disappointment. In the rarified light of breaking dawn, all I saw was a lone well, driven by a rod pump, breaking the silence of early morning. A tiny chemical pump and a cylinder were sitting limply on one side. What is it that you expect me to optimize? I asked Mike with a slight disappointment in my tone. Reduce the chemical dosage rate by 15% was Mike's simple answer.

After overcoming my initial disappointment with the simplistic layout of my first visual of an oilfield, I realized that my steel toe boots were cold and soggy from the trek up the hill. The wind was picking speed with daybreak and my woolen socks, the heavy parka and earmuffs were rather inadequate for the ambient temperature of 26°F (-3.3°C). The cold air snapped my mind out of my ponderings, to quickly assess the situation and start processing the information at hand or else I could see myself frozen in the next hour.

Mike and Curt got busy with setting up the Polarograph¹ to measure the chemical residuals. I was allowed to run back and forth from the equipment shack to the heated truck to seek respite every few minutes. I set out to calculate the liquid velocities, transit times, Reynolds number (a measure of turbulence) and kinetics of reaction in the system based on the operating conditions and chemical residuals.

After the excitement of the survey had waned, I waited patiently, and often impatiently, to get back to civilization, as there were no restrooms within thirty minutes of drivable distance. A wet steel toe shoe and winds howling at 20 mph did not help the situation either. We had to wait over three hours to obtain HS&E² approval to implement the changes to optimize the dosage. During this time we got visited by three different crews of roughnecks (curious to see the "Indian" woman engineer).

Finally, per my analysis, we changed the injection rate to a location where fluid temperatures and higher velocities were more favorable for effective utilization of chemical. It was actually a fairly simple concept but I was delighted that I contributed to the success of the project, as this was my first real assignment in a real job. By 11:00 a.m., we verified with great relief that the chemical dosage had been successfully reduced by 20%. From the well site, we drove to the customer office picking up my abandoned car on the way back. The offices were a set of randomly placed trailers at the base of the hill. I patiently waited another hour before I was admitted to the Operation Superintendent's office. I was teased for being the privileged one as the Superintendent had agreed to meet me and even invited me to sit in the operations meeting. During prior visits,

¹ A differential pulse polarograph is used to measure chemical residuals by recording current in the test solution as the applied voltage reaches the potential at which the chemical reacts electrochemically.

² HS&E – health, safety and environmental approval to implement a change

my colleagues were not offered this option. The customer was a tall man in his mid-forties with chiseled features, chewing tobacco, with long legs resting on the table showing off his fancy cowboy shoes - shoes that I had not seen in Texas in my student days except for the Rodeo. Faced with yet another surprising appearance, I managed to excitedly recount my analysis of the system and our contribution of \$20,000 in annual savings in chemical cost to the customer.

Eight years later, I am now an oilfield veteran in my company and yet the surprises of fieldwork continue to come my way. Last week during the company's Christmas luncheon, I was pleasantly surprised to receive an "Outstanding Achievement Award" approved by a committee of peers. The award was for successful optimization of an offshore chemical application in the North Sea that allowed retention of an account worth over 6 million dollars per year.

Next Sunday, it is Christmas, and I have been invited again to Jim's place for dinner. Ever since my graduation, whenever I am in town, they have kept a place for me on Thanksgiving and Christmas. I am eagerly waiting to share my latest oilfield adventures with Jim and his wife over a traditional and very sumptuous meal.

About the Author: Dr. Tauseef Salma is a Section Leader for Gas Conditioning Technology in a leading specialty chemical company servicing the global oil and gas sector. Her current research areas involve hydrogen sulfide mitigation and hydrate control in oil and gas systems. She is responsible for research and development, project management, process evaluation and optimization of oil and gas production using specialty chemicals. Tauseef has a Ph.D. in Chemical Engineering from Rice University and a B.Sc. in Chemical Engineering from U.E.T. Lahore, Pakistan. She has authored and co-authored over sixteen technical publications and holds 1 U.S. patent. Dr. Salma can be reached at tauseefsalma@alltel.net.

Inside a Fairy Tale City by Aneeza Qazi

I was thinking of how to start this article about my experience in the process industry. I was considering highlighting all the problems faced by women in professions, which are male-dominated, and of the pressures in the society and what not... But then I thought, "No. Lets, for a change, write about how good it is to be associated with this profession". So here goes my story of a fairy tale land...

We used to travel by road quite frequently when I was little. During these travels we passed through many industrial areas, which were marked by tall civil structures, smoke coming out of chimneys, intricate conveyer systems and the usual humdrum associated with the plant. At night, the little lights glittering here and there gave the whole scene a fairy tale look. It always fascinated me. Little did I know that when I grow up I'd end up working for these fairy tale cities.

Joining a fertilizer plant situated a good 600 plus km away from home, in the middle of a desert, in the part of the country, which is famous only for its dacoits, was not an easy decision. When I went for the interview, I was reluctant because I knew I wouldn't be able to decline the offer if I got selected. I did get selected and I did accept the offer. I was going away from home for the first time yet the fairy tale city was very attractive and I knew somewhere in the future I would regret not going there if I declined the offer. I mentally decided to stay only for a year and then come back. I went for a year but I stayed on for 5 good years.

Fertilizer manufacturing is said to be the heart of chemical engineering. It is a high pressure, high temperature process involving high-speed rotary machines, catalytic reactors, strippers, absorbers, boilers, prill towers... you name the equipment and we have it in the fertilizer industry. That is why, it is thought of as a very good experience for a chemical engineer to work on a fertilizer plant. Chemical engineers are employed in two roles mainly: operations engineer and process engineer. The process engineering side is the technical side involving troubleshooting of plant problems, design of new facilities and project handling of upcoming expansion or any

other projects. It is a creative job involving proactive thinking and sound analytical skills. The operations engineer job, on the other hand, is mainly ensuring plant operation round the clock and involves good management ability.

Working at the plant means always on the roll. There is always something to be done, something to be optimized, something to be shutdown, something to be started. It also means being safety conscious so you have to wear the heavy safety boots, the safety helmet and cover-alls. Add to it climbing up the monkey ladders, squeezing inside vessels for inspections and standing in the scorching sun supervising maintenance jobs during the turnarounds. All of this is part of the fun and thrill, which makes working in the process industry such a unique experience.

It is amazing to see how urea can be conjured out of thin air – you literally need natural gas, air and steam as raw material for making solid white granules of urea fertilizer... its practically magic!! Making that magic happen, however, is a Herculean task involving design, installation, operation and maintenance of intricate machinery to be able to produce economic production of fertilizer granules meeting the soil nutrition needs of the farmers and making the crops grow better. From the outside, it may seem only the crash, boom, and bang of iron but from the inside its magic happening, something fit to happen inside the fairy tale city. There are so many more fairy tale cities producing seemingly uninteresting products like cement, paper, soap etc yet there is always magic taking place: the art of converting seemingly improbable ingredients into products that improve the quality of life and doing that economically and energy efficiently.

Process industry environment is mostly male dominated. The work involved is also rugged and is characteristically thought of as masculine. Being the only female around in such an environment does not make it less difficult. If anything, it puts some extra pressure on you to perform if not better, then at least equal to your colleagues. General impression about women in such fields is that they are not serious about work and will go away any time. It is, therefore, thought inappropriate to invest in them in terms of training, professional grooming etc. One has to try very hard to dispel such doubts. Once done the task ahead becomes less difficult. Another pitfall to watch out for is making much ado about nothing. There are several organizations that like to hire women to just check out one box on their objectives list “Equal Opportunity Employer”. So they sometimes hire women for a particular job just because they are women. Such organizations then like to project their woman work force and use them more for advertisement purpose. This is detrimental to professionalism and kills the very spirit of gender balance.

All in all it is a delightful experience to be able to follow your dreams, to do what you aspired to do. The key to success is keeping yourself focused on your goal and shutting off all the noise. And yes, it always helps to make a network of friends and coworkers to help you out with advice if nothing else out of difficult situations.

So anybody who is inspired by the little glittering lights of a plant site and wants to explore it is most welcome to. It is a difficult but very interesting world inside.

About the author: Aneza Naqvi is a business development engineer with Engro Chemical Pakistan. She is a graduate of UET, Lahore. Aneza started her career as a process engineer and worked at the urea fertilizer-manufacturing site in Daharki, Sindh for over 4 years. Authored a technical paper for American Institute of Chemical Engineers in 2004.

On Ibtida by Zahra Jamshed

In December 2005 I had the opportunity to attend a fundraiser at the Sundaram Tagore Gallery in SoHo to mark the launch of Chowrangi Magazine's 3rd issue. A portion of the proceeds was to be donated to Ibtida (www.ibtida.org) for post earthquake rehabilitation. Ibtida has a network of several schools for underprivileged

children in Pakistan. At the fundraiser, I had an opportunity to speak with Nuzhat Ahmad (the founder of Ibtida) regarding IOPWEians interest to sponsor Ibtida's efforts.

Z: How did you get involve with Ibtida? Please provide some background.

N: I, along with a couple of other people, founded ibtida in March 2003. We had been supporting education projects informally since 1999. In 2002, we brought ibtida under fiscal sponsorship of PPHF, a US-based 501©3 organization. In March 2003, we received our own tax-exempt status, and thus ibtida in its current form came into being. We have a board of directors, who are all voluntary. Our coordinator in Pakistan also works on a voluntary basis. We spend our own money on administrative expenses. As a result, almost 96-97% of the money directly goes to the education projects that we support.

Z: What is your 5-year plan for this organization?

N: Our 5-year plan is to take the 3 schools that we currently support to the Matriculation level. This is being achieved with adding on a class each year in the new academic session. In addition, once the children have reached Matric (grade 10th), the plan is to have the students choose further academics versus vocational training. A scholarship program will be implemented at this juncture.

In addition, we are evaluating educational projects for girls in Dadu, Sindh, as well other smaller projects in NWFP. Our plan is to support at least 2 other long-term projects in the next 5 years. We also want to streamline our fundraising activities, so that we can start an endowment for these projects. Build an ongoing collaboration with a teacher resource center, so that our teachers can receive continuous training. For the most part, our philosophy is to go into projects for the long-term, and support them for a period of at least 5 years, if not more.

Z: What process do you have in place to monitor a child's progress?

N: We monitor the progress of the school as a whole. We do this through feedback from students, parents and teachers. The overarching goal of ibtida is to provide an education that is more than getting a degree to secure a job. Rather, education at our schools should produce civilized citizens. We highlight values of peace and pluralism in our curricula. These obviously are intangible values and are somewhat difficult to measure. We do, however, monitor enrollment and dropout rates stringently. We encourage active community outreach by the teachers to encourage enrollment.

In addition, some of our board members interact directly with the students and teachers to identify problems. Efforts are made for remedial work for students and teachers. Teachers' salary increments are also based on the performance of their students.

Z: If I plan to support a girl child till she is self sufficient, how will you monitor her progress and provide me with regular updates?

N: Ibtida provides six-monthly progress reports regularly. If donors donate for a specific project, then we provide them with regular updates on those projects through e-mail. We monitor the students' progress through on-site school management committees.

Z: Are you also teaching any skills to the young children to be self-sufficient?

N: Currently, computers are the only skill being taught. The highest class in our schools is class 7.

Z: How can IOPWE members contribute on a monthly basis to ibtida? What's the best way?

N: Through Pay Pal on our website or personal cheques.

Z: Please highlight ibtida's accomplishments in 2005.

N: We built a purpose-built building for the Nilore Junior School, increased



enrollment at our schools by 20%, incorporated a children's human rights curriculum in the school and started 3 tent schools for 320 children in the earthquake affected areas; Balakot, Ghazikot and Shawal Najaf.

Professional Experiences of IOPWEians in Pakistan

1. Sarah Mumtaz Hashmi – Sales and Marketing : My joining Dewan Motors in the After Sales Department came as a surprise to many including the Departmental Head, as there were not any females working in Automobile Service (purely technical) Section handling nationwide warranty on Mitsubishi Vehicles. I still have not heard of anyone else beside myself in this particular field. At the time I joined, the environment at my workplace was not very welcoming.

With Dewan being a male dominated organization, and after Sales where there is no concept of having a female around I had to face many problems, both regarding the work place and social issues. The premises where I work did not even had the basic necessities as a female washroom. For my colleagues, I was initially an object of attraction. However, those above me in the management made full efforts to make it a smooth a transition, but still you just cannot change the mindset of a hundred staff members. There were colleagues who were not willing to accept me as their boss. (I forgot to mention I have done my BCS from FAST and then my majors in marketing from IBA, a weird combination for my field, got the job because of my passion for automobiles). Moreover, there were not any MBA's around so u can imagine the kind of working environment they might have had.

Over the period of one and a half year, I literally had to push my way through, portraying myself as not a threat to those who had been working here for ages, making them comfortable with the idea of working with the opposite sex.

This I did not only by giving them a sense of security but also by setting new traditions in the organizational culture. I would collect money and bring a cake if it's somebody's birthday or would buy a gift if somebody is getting married or had a child.

Overall, now still when I am leaving this place (due to my personal priorities), though my efforts have not been completely fruitless, there are still people who have not been able to accept me as a colleague. Despite, there are many who do not want me to leave because of the changes I brought to the culture, and am satisfied with what I have achieved here.

I shared this to tell all those who are working in such environments, that all is not that bad, with a little extra effort and tolerance on your part, can help you make your place in the organization.

2. Naila Amin – Computer Scientist: I graduated from Fast in '02 and till October 2005, had been working as a software engineer in different software houses of Karachi. I had a passion for coding, programming and designing software right from the initial days of my alma mater. The first company I worked with was developing a simulation for Pakistan Navy. It was a huge simulation project spanning over 3+ years. When I joined I was the only lady that had joined that company. Unfortunately, I shared the same washroom as my male colleagues and found myself more treated around as a 'female' than a colleague.

Around four other male classmates from another good university were hired with me. The problem started when our manager started formulating teams for this project. The people hired with me were made team leads automatically due to 'seniority'. When it came to me, I was made a part of one of the teams "naturally" since I was a female. This was completely unacceptable to me, as I had a good programming and designing background at Fast and was equally senior. Over that period of time I found that the guys hired with me were clearly of no comparison to my software engineering skills. I was paid a little less than what they were being paid and was

facing all types of discrimination from all departments of the company.

That was the time when I put my step down. I simply went to the CEO and clearly communicated what I liked about the company and what I totally disliked particularly how I was being treated. Fortunately, the CEO of the company was a nice and just man. He understood my point(s) and handed me over another important console of the project. I undertook the task, worked on it with my heart and soul and lived up to the expectations of my managers. I had broken the glass ceiling, from that point onwards things became easier and I somehow managed to prove to them that girls do not acquire BCS degree to just end up documenting, organizing, supporting or just selling software solutions. At the end of my tenure there, I was compensated for the salary difference too. That was the starting point of my career. When I switched over to the financial domain, I experienced even more hurdles. I found quite interestingly, my being on male-oriented projects hurt many under the belts. Time and time again my visits to the Destroyers, Submarines, Aircrafts, Mine hunters of Pakistan Navy hurt the egos of many and they started working harder to match my competency and somehow feel superior in my presence.

When I moved on to the financial industry, my presence automatically made some people think seriously. One of the senior officers of the State Bank started taking immense interest in emerging technologies like EMV etc. when he realized that I had a good knowledge of it along with many other capabilities at which I surpassed them. I still remember the comments he made in the presence of my bosses there: "Agar is larki ko itna kuch pata hai to hamay kuun nahi pata hai" [If this girl knows so much, how come we don't]. Rest of the time he spent convincing and concluding that even if I am accomplishing so much at work, it is only a matter of time and soon I'll get married and go off on maternity leave doing no good to the projects.

When I graduated, I could never imagine the amount of discrimination I was about to see. But after 3 years of work experience, I know that I have only seen the tip of the iceberg. Much of it is still to come and I have to keep fighting to find my way through. Now when I am part of a multinational with their presence in 600 countries, I am not sent to expensive trainings unlike my male colleagues. Why would they invest on a person who is inferior to them and has the likelihood of leaving the company any moment?

The Cellular Industry & Views of its female workforce by Madeeha Basharat

Cellular mobile services in Pakistan were commenced in 1990s when two cellular mobile telephone licenses were awarded to Paktel and Pak Com (Instaphone) for provision of cellular mobile telephony in Pakistan. Currently there are six cellular players in the market, out of which Paktel is providing both GSM and DAMP networks while out of the other 5 only Instaphone is DAMP and rest are GSM networks.

Paktel is moving its old DAMP network to GSM while Instaphone plans to change itself from DAMP to CDMA. Mobilink became the first GSM network in Pakistan in 1992 but it was not after the launch of Ufone in year 2000 that the mobile market started to grow but the immense rise in the cellular density of Pakistan was seen in 2005 when two more licenses were given to Warid and Telenor to operate their GSM networks.

From 0.1% in 1996-97 it has gone up to 6.91% at present and still continuing to grow. The number of subscribers were a meager 68 thousand 10 years ago, now stand at about 15 million. With the current boom in the telecommunications market I wanted to pen down some of the issues/topics females working in this field have on their mind.

The sudden demand for engineers has opened avenues for software engineers as well to carve a niche for themselves in the telecomm industry. One such example is *Sidrah*, a software engineer by education who worked in the software industry and recently switched to the flourishing mobile networks division of Siemens. Here, like her last job, she joined as a developer. She however did not find a major change between both the offices. The difference that she did note was in the nature of work. While in her previous job, the stress was on

developing a product which was more user-friendly and less prone to bugs within the specified timelines, here the product is less of user friendly and more for a technical oriented audience. Timelines are vague since almost everywhere an emergency need for a product is present.

Hajira another engineer taking a break from work to take care of her newborn was of the opinion that the private sector especially had yet to see the constraints of the working moms. She said, “Having a family member take care of your child may be the best option but it is not available to all. In such scenario offices need to be more considerate. We have a trend in offices where timings are not hard and fast and females are expected to sit beyond the normal 5 o’ clock time and anybody failing to meet the expectations is not looked upon favorably. Every woman will eventually be becoming a working mom and companies need to be look into options of flexi-hours and work from home. Jobs need to be result oriented. The industry needs to grow out of the impression that marriage and children does not put a full stop to career. By not investing in trainings for girls and failing to give them key responsibilities, the industry is failing to tap a valuable resource.”

Najia being a software engineer worked in Quality assurance department of ZTE before switching to Siemens. Her views were that in her line of work she had not experienced any difference between working males and females however as a distant observer she did feel that girls working on purely technical side have to struggle hard to make their efforts noticeable

The industry also saw vendors coming in and expanding as well the operators. Siemens, Ericsson, Nortel etc. all expanded their cellular wings while Nokia started anew in Pakistan. Whilst most people can’t differentiate between working for an operator or vendor, *Mahwish*, a telecomm engineer at Nortel presales, experienced both to know the difference quite well. She was of the view that compared to operator working for a vendor was more challenging and demanding. At the operator they always had the vendor to fall back on but vendor side meant having to come up with the solution for the customer. Operator side also meant more of reporting while vendor meant working at the back end with technically in depth knowledge of the equipment. She severely felt that it was the need of the hour for vendors to bring their development to Pakistan. She however did feel great working for the industry at a time when fancy words like WiMax, WLL and MNP were being put into practice.

Due to constraints in space these were just some of the excerpts from the conversations I had with these ladies. Still the thoughts shared by them are very much relevant to other working women in Pakistan. With women in the higher hierarchy of the telecomm companies being very rare and almost none on the technical side, to make a place there is certainly an uphill task. Newcomers need to be more focused and should definitely use the experience of their seniors to deal with prevalent issues. This is where IOPWE forum takes importance and the platform should be utilized to maximum extent.

About the author: *Madeeha Basharat is a Telecommunications Engineer, Graduate from MCS-NUST. Based in Islamabad and presently working as Optimization Engineer for Core Network at Mobile Networks division of Siemens Pakistan.*

Molecular Nanotechnology by Omar Cheema

This article introduces Molecular Nanotechnology (MNT), its applications, hazards and benefits followed by the policy issues for technology utilization. The word "nanotechnology" encompasses several areas of research.

- a. Areas dealing with building small structures that have novel properties. Such research adds steadily to the technological toolbox, leading to improved products and occasionally to new industries.
- b. Research that is science-fictional in nature, in which nano-bots can go anywhere and do anything but generally do not conform to reality.

c. Molecular nanotechnology ("MNT") is an anticipated manufacturing technology that would allow precise control and positional assembly of molecule-sized building blocks through the use of nano-scale manipulator arms. Molecular Nanotechnology is the "engineering of tiny machines — the projected ability to build things from the bottom up, using techniques and tools being developed today to make complete, highly advanced products." Shortly after this envisioned molecular machinery is created, it will result in a manufacturing revolution.

Idea of a Nanofactory:

A nanofactory will be the end result of a convergence between nanotechnology (molecular scale engineering), rapid prototyping, and automated assembly. These are all present-day technologies. None of them has yet reached its full potential, but each of them is advancing rapidly, driven by powerful economic, social, and military forces. The integration of the three technologies will be far more powerful than the sum of the parts.

Maybe, it sounds fictional at the moment. But it looks like a reality when we see the work done so far in the domain of Nanotechnology. Not going into technical details, it is important to mention that much of the basic science work related to nanofactory has already been done; what remains is the engineering to create a working device and then integrate many devices into a human-scale "nanofactory". Although most nanotechnology projects today focus on nanoscale technology, development of molecular manufacturing will surely become a priority within a few years. Full capability for this may not be developed for a decade or longer, but preparation for it should probably start now.

Already scientists have made chemical reactions happen by directly manipulating the individual atoms. They can draw lines of chemicals only ten atoms wide. They can send electricity down molecular wires. They can attach propellers to molecular motors and analyze their performance. They can make functioning tweezers from DNA molecules. Within a few years, we will have the ability to build three-dimensional, active, molecular constructions. It's a small and predictable step to building robots and chemical plants at the nanometer scale.

Some experts claim that a crash program started today could complete the first working nanofactory within a decade for an estimated cost between five to ten billion dollars. And once the first one is built, it can replicate itself. This huge sum of money may cause people to question the feasibility of such research but imagine the economic, environmental and humanitarian benefits, when nearly any product can be manufactured on the spot for about \$1 per pound. Imagine the cost cutting including shipping, timesavings, and the environmental impact with no wasted resources or hazardous by-products. The world will no longer suffer from starvation, homelessness, or poverty.

Applications of Molecular Nanotechnology: Applications for nanotechnology cover every aspect of human life on earth.

Environmental Applications - Water shortage is a serious and growing problem. Most water is used for industry and agriculture; both of these requirements would be greatly reduced by products made by molecular manufacturing. Infectious disease is a continuing scourge in many parts of the world. Simple products like pipes, filters, and mosquito nets can greatly reduce this problem. Information and communication are valuable, but lacking in many places. Computers and display devices would become stunningly cheap. Electrical power is still not available in many areas. The efficient, cheap building of light, strong structures, electrical equipment, and power storage devices would allow the use of solar thermal power as a primary and abundant energy source.

Environmental degradation is a serious problem worldwide. High-tech products can allow people to live with much less environmental impact. Many areas of the world cannot rapidly bootstrap a 20th century manufacturing infrastructure. Molecular manufacturing can be self-contained and clean; a single packing crate or suitcase could contain all equipment required for a village-scale industrial revolution.

Medical Applications - Molecular nanotechnology will impact the practice of medicine in many ways. Medicine is highly complex, so it will take some time for the full benefits to be achieved, but many benefits will occur almost immediately. The tools of medicine will become cheaper and more powerful. Research and diagnosis will be far more efficient, allowing rapid response to new diseases, including engineered diseases. Small, cheap, numerous sensors, computers, and other implantable devices may allow continuous health monitoring and semi-automated treatment. Several new kinds of treatment will become possible. As the practice of medicine becomes cheaper and less uncertain, it can become available to more people.

Computer related Applications - Molecular manufacturing can create computer logic gates a few nanometers on a side, and efficient enough to be stacked in 3D. An entire supercomputer can fit into a cubic millimeter, and cost a small fraction of a cent. With actuators smaller than a bacterium, a thin, high-resolution computer display will be easy (and cheap) to build. With GHz mechanical frequencies, a mostly-mechanical device can sense and produce radio waves. Thus computation, communication, and display are all feasible with pure diamondoid technology. Computers, PDAs, and cell phones can be cheap enough for even the poorest people on earth to own one, and contain more than enough processing capability for a voice interface for illiterate people. Distributed networking hardware can likewise be very cheap, and distributed networking software, though not trivial, is already being developed. The whole world could get "wired" within a year.

Energy Applications - The main source of power today is the burning of carbon-containing fuels. This is generally inefficient, frequently non-renewable, and dumps carbon dioxide and other waste products (including radioactive substances from coal) into the atmosphere. Solar energy would be feasible in most areas of the globe if manufacturing and land were sufficiently cheap and energy storage was sufficiently effective. Solar electricity generation depends on either photovoltaic conversion, or concentrating direct sunlight. The former works, although with reduced efficiency, on cloudy days; the latter can be accomplished without semiconductors. In either case, not much material is required, and mechanical designs can be made simple and fairly easy to maintain. Sun-tracking designs can benefit from cheap computers and compact actuators. Energy can be stored efficiently for several days in relatively large flywheels built of thin diamond and weighted with water. Smaller energy storage systems can be built with diamond springs, providing a power density similar to chemical fuel storage and much higher than today's batteries. Water electrolysis and recombination provide scalable, storable, transportable energy. However, there is some cost in efficiency and in complexity of technology to deal safely with large-scale hydrogen storage or transportation.

Agricultural Applications - Moving agriculture into greenhouses can recover most of the water used, by dehumidifying the exhaust air and treating and re-using runoff. Additionally, greenhouse agriculture requires less labor and far less land area than open-field agriculture, and provides greater independence from weather conditions including seasonal variations and droughts. Greenhouses, with or without thermal insulation, would be extremely cheap to build with nanotechnology. A large-scale move to greenhouse agriculture would reduce water use, land use, and weather-related food shortages.

Social Applications - Much social unrest can be traced directly to material poverty, ill health, and ignorance. Molecular manufacturing can eliminate material poverty at least by today's standards; post-MNT standards may be considerably higher. Products of molecular manufacturing can greatly improve health by eliminating conditions that cause disease, including poor sanitation, insects, and malnutrition. Widespread availability of computers and communication devices can provide exposure to other cultures and diverse points of view, and create an understanding of a broader social context in which to evaluate actions and beliefs. Unfortunately, mass communication also gives demagogues a wider audience, which may undo some of this benefit but the benefits are certainly overwhelming. MNT certainly will not cure or prevent social unrest, but it will remove many tangible causes of distress.

Molecular nanotechnology (MNT) will be a significant breakthrough, comparable perhaps to the Industrial Revolution—but compressed into a few years. This has the potential to disrupt many aspects of society and politics. The power of the technology may cause two competing nations to enter a disruptive and unstable arms

race. Weapons and surveillance devices could be made small, cheap, powerful, and very numerous. Cheap manufacturing and duplication of designs could lead to economic upheaval. Overuse of inexpensive products could cause widespread environmental damage. Attempts to control these and other risks may lead to abusive restrictions, or create demand for a black market that would be very risky and almost impossible to stop; small nano-factories will be very easy to smuggle, and fully dangerous. There are numerous severe risks—including several different kinds of risk—that cannot all be prevented with the same approach. Simple, one-track solutions cannot work. The right answer is unlikely to evolve without careful planning. Within a short time, we are going to enter the nano-age.

It sounds too good to be true: a non-polluting, personal-size machine that within a few hours and for a few dollars can manufacture almost anything—clothing, books, tools, communication devices—but there is a catch. It can also manufacture weapons, poisons, tiny surveillance cameras, and other illicit products. With every advancement that mankind has invented there have always been adverse affects that our generations have to deal with. To avoid the risk of destructive applications from rogue elements and to cope with the sudden social changes taking place because of rapid introduction of nanotech, it is important that we start planning from now and make the policies that help the humans increase their standard of life and makes world a safer place.

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About the author: *Omar is currently a PhD Candidate in embedded systems at Université Paris-sud, France. He received his B.Sc. Electrical Engineering from UET Lahore. His interests include writing articles on scientific issues particularly related to Pakistan.*

Pak-Millenium Conference 2006

Title: "Celebrating Pakistani Women: Their Lives and Struggles"

Date: April 29, 2006

Location: Tufts University, Fletcher School of Law and Diplomacy, Medford, MA

Summary of topic: The conference, "*Celebrating Pakistani Women: Their Lives and Struggles*", will look at the struggles and achievements of Pakistani women from a fresh perspective. The idea is to show women in Pakistan as agents of change and progress rather than as passive victims of gender inequities. The conference will examine societal, legal/political and economic constraints women confront in Pakistan and delineate strategies they employ to overcome them. It is hoped panelists will both highlight existing problems and prescribe policy recommendations that could serve to change the current landscape in favor of women's progress.

Proposed speakers:

Panel One: Societal constraints

Speakers: Farzana Bari, Qurat-ul-ain Bakhteari, Shahla Haeri

Panel Two: Political/Legal constraints

Speakers: Raheela Qazi, Sherry Rahman, Hina Jilani

Panel Three: Economic constraints

Speakers: Musharraf Hai, Bina Agarwal, (third panelist to be determined)

Panel Four: Civil Society (For this last panel we hope to have speakers from the first three panels talk about the role of civil society in Pakistan in the empowerment of women.

About the Pak-Millennium Conference: The conference builds on the work of previous successful Pak-Millennium Conferences that have addressed critical policy issues in a serious manner engaging thought leaders from Pakistan and the U.S. Previous Pak-Millennium Conferences have focused on Higher Education reform, Strengthening Civil Society and Democracy, Governance, Prospects for Business.

Past notable speakers have included Safi Qureshy, Mr. Shaukat Aziz, Dr. Ishrat Hussain, Dr. Ata ur Rahman, Mr. Shams Kasem Lakha, Syed Babar Ali, Prof. Henry Rosovsky, Dr. Shahid Javed Burki, Dr. Pervez Hoodbhoy, Dr. Riffat Hasan, Dr. Tariq Banuri, Prof. Adil Najam, Vice Chancellors of many Pakistani universities, leading scholars and activists. The Conference has contributed to the policy debates in Pakistan, including actionable recommendations for the *Task Force on Higher Education Reform*.

Current sponsors: Organization of Pakistani Entrepreneurs, Zia Chishti, Babur Mian/Geocomp.