



The Abdus Salam
**International Centre
for Theoretical Physics**
50th Anniversary 1964–2014



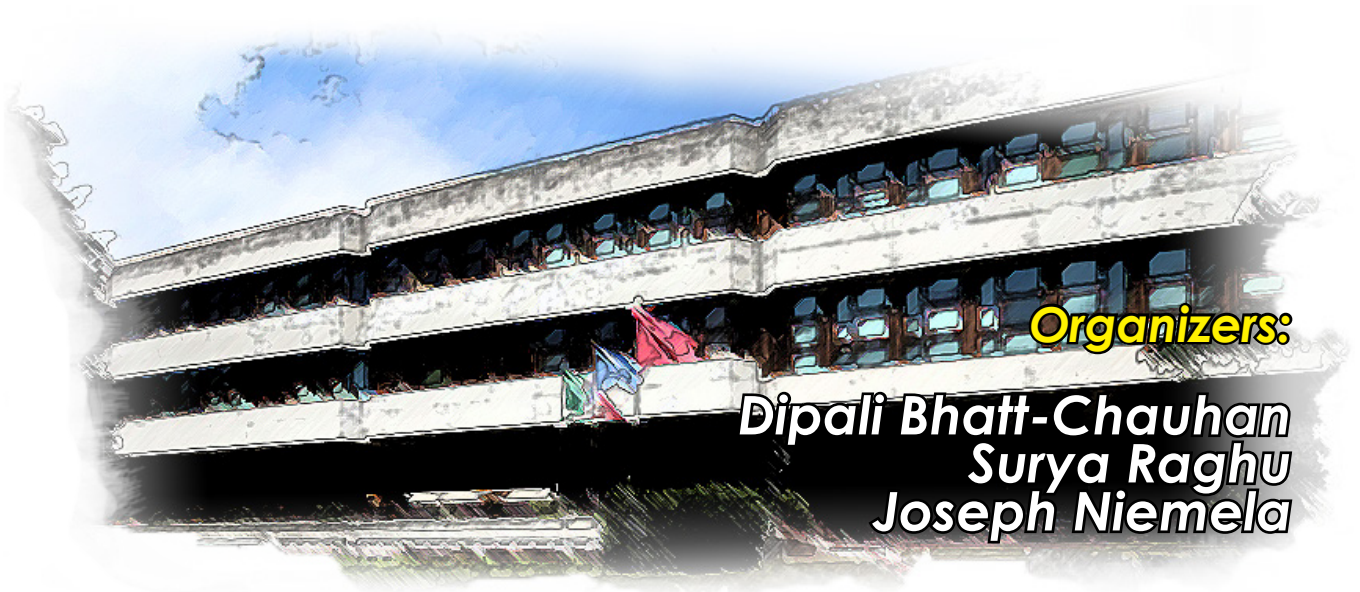
SMR 2576

IOP Institute of Physics



5th Workshop
on Entrepreneurship for Physicists
and
Engineers from Developing Countries

31 March - 4 April 2014



Organizers:

Dipali Bhatt-Chauhan
Surya RaghU
Joseph Niemela



The Abdus Salam
International Centre
for Theoretical Physics
50th Anniversary 1964 - 2014



5th Workshop on Entrepreneurship for Physicists and Engineers from Developing Countries

31 March - 4 April 2014
Miramare, Trieste, Italy

PURPOSE AND NATURE

The Abdus Salam International Centre for Theoretical Physics (ICTP), the American Physical Society (APS), the Institute of Physics (IOP) and The World Academy of Sciences (TWAS) will jointly organize the "5th Workshop on Entrepreneurship for Physicists and Engineers from Developing Countries", to be held at ICTP, Trieste, Italy from 31 March to 4 April 2014. This one-week intensive Workshop is designed for physicists and engineers from developing countries who are interested in learning entrepreneurial skills to commercialize their scientific inventions. Such an educational programme is missing in many of the developing countries for scientists working in universities and scientific institutions. The participants will benefit from the international perspective provided in this Workshop from both experts and co-participants from developing countries.

GOALS AND OBJECTIVES

The objectives of this workshop are to introduce to the scientists the process of innovation, generation and protection of intellectual property, technology transfer and commercialization of inventions. The workshop will consist of lectures by invited speakers, case studies, group discussions and role-playing sessions related to commercialization of a product.

TOPICS INCLUDE

Relation between scientific research, inventions and products; Institutional roles for commercialization; Potential of Physicists and Engineers to be inventors and entrepreneurs; Concept of intellectual property (IP) and its significance in developing countries; Basics of patenting; Global IP protection; Taking science to the market - Timelines and processes for taking an invention to product; Marketing the ideas; Small business financing and business plan fundamentals; Success stories; Business plan presentation by participants; training of lecturers and scientists in development of an 'Entrepreneurship Curriculum'.

PARTICIPATION

Scientists and students from all countries which are members of the United Nations, UNESCO or IAEA may attend the activity. As it will be conducted in English, participants should have an adequate working knowledge of this language. Although the main purpose of the Centre is to help research workers from developing countries, through a programme of training activities within a framework of international cooperation, students and post-doctoral scientists from developed countries are also welcome to attend. This is a demanding program and participants should be willing to work hard during the entire week.

As a rule, travel and subsistence expenses of the participants should be borne by the home institution. Every effort should be made by candidates to secure support for their fare (or at least half-fare). However, limited funds are available for some participants from developing countries, to be selected by the organizers. **There is no registration fee.**

How to apply for participation

The application form can be accessed at the activity website:

<http://agenda.ictp.it/smr.php?2576>

Once in the website, comprehensive instructions will guide you step-by-step, on how to fill out and submit the application form.

Activity Secretariat:

The Abdus Salam International Centre for Theoretical Physics (ICTP)
(SMR 2576), Strada Costiera 11, I-34151 Trieste, Italy

Telefax: +39-040-2240-7455 - E-mail: smr2576@ictp.it

ICTP Home Page: <http://www.ictp.it>

Trieste, December 2015



CO-SPONSORS

AMERICAN PHYSICAL SOCIETY, USA
THE INSTITUTE OF PHYSICS, UK
TWAS (THE WORLD ACADEMY OF SCIENCES), ITALY

CO-ORGANIZERS

DIPALI BHATT-CHAUHAN, UK
JOSEPH NIEMELA, ICTP
SURYA RAGHU, USA

SPEAKERS

To be confirmed

RICHARD BROOKS, UK
YUMIKO HAMANO,
SWITZERLAND
DAWOOD PARKER, UK
SURYA RAGHU, USA
DAVID SECHER, UK
OTHERS TBD

APPLICATION DEADLINE

20 JANUARY 2014



About ICTP

Cutting edge research, education and training

For more than 45 years, the Abdus Salam International Centre for Theoretical Physics (ICTP) has been a driving force behind global efforts to advance scientific expertise in the developing world.

Founded in 1964 by the late Nobel Laureate Abdus Salam, ICTP seeks to accomplish its mandate by providing scientists from developing countries with the continuing education and skills that they need to enjoy long and productive careers. ICTP has been a major force in stemming the scientific brain drain from the developing world.

ICTP alumni serve as professors at major universities, chairpersons of academic departments, directors of research centres and ministers of science and technology in nations throughout the developing world. Many of them have been recognized in their own countries and internationally for their contributions to science and science policy. The impact of ICTP extends well beyond the Centre's facilities to virtually every corner of the Earth.

In 2014, ICTP will be celebrating its 50th anniversary. More information about events to mark the milestone will be posted on the:

[ICTP 50th Anniversary Webpages.](#)

IOP Institute of Physics

The Institute of Physics, London

The Institute of Physics is a leading scientific society promoting physics and bringing physicists together for the benefit of all.

It has a worldwide membership of around 40,000 comprising physicists from all sectors, as well as those with an interest in physics. It works to advance physics research, application and education; and engages with policy makers and the public to develop awareness and understanding of physics. Its publishing company, IOP Publishing, is a world leader in professional scientific communications.

For further information please see:

<http://www.iop.org>





American Physical Society

The American Physical Society (www.aps.org) is a non-profit membership organization working to advance and diffuse the knowledge of physics through its outstanding research journals, scientific meetings, and education, outreach, advocacy and international activities. APS represents over 50,000 members, including physicists in academia, national laboratories and industry in the United States and throughout the world. Society offices are located in College Park, MD (Headquarters), Ridge, NY, and Washington, DC.

For further information please see:

<http://www.aps.org/>



Director's Welcome

Welcome Message from the Director

Welcome to ICTP! We are the world's first and leading global scientific institution for fundamental research and development. For nearly 50 years, of its existence, ICTP has played the crucial role of being a bridge between North and South and East and West, the latter during the Cold War. Through the adoption of the universal language of science, ICTP has demonstrated the importance of a global approach to address the problems of our time. Its primordial mission is to bring together scientists from all over the world in order to facilitate the dissemination of scientific know-how in the poorer parts of the world.

In line with the dramatic geo-economic changes taking place, we are now entering a new phase in which ICTP should take a leading role in promoting better working conditions for scientists in the developing world. We aspire to assist science policy makers and scientists of these countries in the creation of local centres of excellence and active scientific networks. In order to confront these new challenges, the ICTP will collaborate with scientists in emerging countries, assisting in this way the poorest regions in Africa, Latin America and Asia whilst, simultaneously, strengthening and broadening the research activities of our Centre.

During its 50 years, ICTP has benefited over 100,000 scientists although the real impact goes beyond any measurable quantity. Today, we are facing new exciting challenges since the mission of our Centre is as important, if not more, than it was at the time of its inception: to foster top quality scientific research and knowledge in all corners of the world to achieve cultural richness, sustained development and the survival of humankind.

With best wishes,

*Fernando Quevedo
Director, ICTP*



5th Workshop
on Entrepreneurship for Physicists
and
Engineers from Developing Countries

31 March - 4 April 2014

(DRAFT PROGRAMME)

Entrepreneurship Workshop for Physicists and Engineers
ICTP 2014
(Draft Programme)

DATE:

Day 1: Monday, March 31, 2014

Session Chairs: Morning: Beth Taylor

Afternoon:

Dipali Bhatt-Chauhan

| Time | Subject | Speaker |
|---------------|--|--------------------------------------|
| 8:30-9:30 | Registration | |
| 9:30-9:40 | Welcome Remarks | ICTP, IOP |
| 9:40-10:00 | Workshop Objectives | Dipali Bhatt-Chauhan and Surya Raghu |
| 10:00-11:00 | Speed-Networking Exercise | Richard Brooks and Joe Niemela |
| 11:00 – 11:30 | Coffee Break | |
| 11:30-12:30 | Can Scientists and Engineers be Entrepreneurs? | Dawood Parker |
| 12:30-2:00 | Lunch | |
| 2:00 – 3:00 | Making a business case of an idea – a classroom exercise | Richard Brooks |
| | Coffee Break | |
| 3:00-4:00 | Market Research, Technology Forecasting and Opportunity Assessment | Surya Raghu |
| | Coffee Break | |
| 4:30-5:30 | Intro to group project Groups meet with mentors | Richard Brooks All Speakers |
| 5:30 – 6:30 | Group Project Part 1 1. Product idea 2. Management team Wrap-up for Day 1 | All Speakers Dipali and Raghu |

Day 2: Tuesday, April 1, 2014

Session Chairs: Morning: D. Parker

Afternoon: Y. Hamano

| Time | Subject | Speaker |
|--------------|--|-----------------------------------|
| 8:30 – 9:30 | Concept of intellectual property, its significance and protection for starting a high-tech company IP: Patents, trade secrets and trademarks Who is the inventor and who is not? Who owns the rights to an invention – you or your organization/company? NDA and PIA | Yumiko Hamano |
| 9:30-11:00 | Introduction to financial terminology A worked gross margin calculation Team exercise using financial forecast App | Richard Brooks |
| 11:15-11:30 | Coffee Break | |
| 11:30-12:30 | Classroom exercise on patenting an idea | Yumiko Hamano |
| 12:30 – 2:00 | Lunch with mentors, Group Photo | |
| 2:00 – 3:30 | Classroom exercise on commercializing an idea | Dawood Parker and Tony Bunn |
| 3:30 - 4:00 | Coffee Break | |
| 4:00 – 5:00 | Taking the inventions to market – Evaluating the Technology Readiness Level (TRL) of an invention for commercialization, processes involved and estimates of time required to develop a product from an invention. | Surya Raghu |
| 5:00 – 6:00 | Group Project Part 2 1. IP evaluation and IP strategy 2. Financial Overview 3. Estimating potential gross margin 4. Evaluating your invention's TRL and time estimates to market readiness | All speakers, participants |
| 6:00 | Wrap-up for the Day 2 | Dipali Bhatt-Chauhan and S. Raghu |

Day 3: Wednesday April 2, 2014

Session Chairs: Morning: C. Tuniz

Afternoon: B. Taylor

| Time | Subject | Speaker |
|---------------|--|-----------------------------------|
| 8:30-10:00 | Developing Key Entrepreneurial Competencies - exercise | Fulvia Farinelli |
| 10:00 – 10:30 | Coffee Break | |
| 10:30-11:30 | Business Plan Fundamentals Introduction to simple valuation, Return on Investment - exercise | Richard Brooks |
| 11:30-12:30 | Importance of Marketing and Competition Analysis Consumer behaviour surveys and customer feedback | Tony Bunn |
| 12:30-2:00 | Lunch with mentors | |
| 2:00 –3:30 | Lessons from start-ups and spin-offs (45 minutes each) | Tony Bunn Dawood Parker |
| 3:30–4:00 | Coffee Break | |
| 4:00 – 5:00 | Legal Issues, Contracts and Agreements for Entrepreneurs | Yumiko Hamano |
| 4:45-5:45 | Group Project Part 3 1. Forecasting costs and cash requirement, cash breakeven, valuation, Return on Investment 2. Customer Identification 3. Competition Analysis 4. Barriers to Entry 5. Contracts and Agreements | All speakers and participants |
| 5:45-6:00 | Wrap-up for the Day 3 | Dipali Bhatt-Chauhan and S. Raghu |

Day 4: Thursday, April 3, 2014

**Session Chairs: Morning: F. Farinelli
Afternoon: Tony Bunn**

| Time | Subject | Speaker |
|--------------|--|---|
| 8:30-9:15 | Presentation Skills | Beth Taylor |
| 9:15-10:00 | Where to go for cash and Investor expectations | Richard Brooks |
| 10:00-10:30 | Coffee Break | |
| 10:30-11:30 | Team Exercise: Opportunities and Challenges for your Technology Commercialization | Beth Taylor/Raghu/Dipali |
| 11:30-12:30 | Key Decisions in Starting a Business and Dealing with Failures | Surya Raghu |
| 12:30 - 2:00 | Lunch with mentors | |
| 2:00-2:30 | Writing Skills for Research and Business Plans | Joe Niemela |
| 2:30-3:00 | Introducing Entrepreneurship and Business skills in Science Curriculum | Dipali Bhatt-Chauhan and S. Raghu |
| 3:00 onwards | Group Project Part 4 Participants complete the 10-minute pitch and practice for Friday's presentation using guidelines provided. | All speakers available for consultation on projects |
| 4:00 - 4:15 | Coffee Break | |

Day 5: Friday, April 4, 2014

| Time | Subject | Speaker |
|------------------|---|---|
| 09:00 – 9:30 | Participants upload business plan presentations | Panel: All Speakers and Local representatives |
| 09:30 | Introduction of the panel of judges | Chair: Claudio Tuniz |
| 10:00 – 11:00 | Session 1, Participant Business Plan Presentations 3 Groups | |
| 11:00 – 11:15 | Coffee Break | |
| 11:15 – 12:15 | Session 2, Participant Business Plan Presentations 3 Groups | |
| 12:15 – 14:00 | Lunch Break | |
| 14:00 – 15:00 | Feedback to the participants on their plans | All panelists: Moderator: Richard Brooks All participants |
| | Feedback from participants to the organizers (written and informal) | Moderator: Surya Raghu |
| 15:00 – 15:30 | Concluding Remarks | TBD TBD Dipali Bhatt-Chauhan Surya Raghu |
| 15:30- 16:00 | Distribution of Certificates after handing out the feedback forms | |

Directors
and
Speakers



Dr. Dipali Bhatt-Chauhan

Organizer

International Relations Manager

the Institute of Physics (IOP)

Portland Place London W1B 1NT, UK

Email: dipali.bhatt-chauhan@iop.org

Dipali is currently responsible for a wide range of IOP's international activities, with particular experience in enhancing educational opportunities in developing countries and Africa such as Ghana, Gambia, Ethiopia and Rwanda, and providing professional development opportunities for practicing scientists in countries such as Jordan, Lebanon, the Philippines and Brazil.

Dipali manages IOP's school programme, *IOP for Africa*, and have established nine IOP Resource and Teacher Training Centers to promote hands-on physics education throughout Sub-Saharan Africa, and provide low-cost equipment and training for teachers in developing countries.

Alongside her educational work, Dipali designs and organises training programme for scientists and engineers from developing countries on 'Entrepreneurial Skills'. The Entrepreneurship Workshops are designed to introduce key concepts to scientists and engineers, from technology transfer to the commercialisation of research and the generation and protection of intellectual property.

She also manages the Institute's relations with other physics-related learned societies outside the UK.

She did her PhD in Molecular Electronics from The University of Sheffield, UK, following which she gained professional experience working in both the semiconductor industry and academia in the UK. She is a member of International Union of Pure and Applied Physics (IUPAP): Commission C13 Physics for Development and Member of European Physical Society (EPS) - Interdivisional Group of Physics for Development (IGPD).



Dr. Surya Raghu

President

Advanced Fluidics LLC

4217 Red Bandana Way

Ellicott City, USA

Email: sraghu@advancedfluidics.com

Surya Raghu has been a co-director and speaker in workshops on Entrepreneurship for Scientists and Engineers in Argentina, Ethiopia, India, Indonesia, Italy, Jordan, Lebanon, Mexico, Philippines and South Africa, a member of the missions to Morocco and Pakistan on Tech Transfer and Research Commercialization. His recently developed Entrepreneurship Course Module has been implemented in several universities in the developing countries for training university students in the basics of entrepreneurship.

He received his Ph.D. degree in mechanical engineering from Yale University in 1987 and is the founder-president of Advanced Fluidics LLC since 2001. His earlier affiliations were with Yale University, Technical University of Berlin, SUNY Stony Brook, and Bowles Fluidics Corporation. He has also been a visiting scientist at NIST and AFOSR Laboratories and a guest lecturer at Kyushu Institute of Technology, Japan.

Dr. Raghu has inventions related to aerospace, automotive, consumer and biotechnology applications and has been awarded 12 US patents and has over 10 pending patents/invention disclosures as an inventor or co-inventor. He has experience in the development of products from inventions related to physiological monitoring, DNA testing, wireless corrosion sensors, aerodynamic flow control and spray technology and has active research collaborations with many institutions in the US and Europe.

Dr. Raghu is a recipient of the Alexander von Humboldt award from Germany and an Associate Fellow of the AIAA. He has served as an invited member of the Special Emphasis Review Panels on Micro and Nanotechnology at the National Institutes of Health.



Joseph Niemela

ICTP, Trieste, Italy

Email: niemela@ictp.it

Niemela is a Senior Research Scientist at ICTP, which he joined in 2003, and is currently head of its Applied Physics Group. In addition to conducting research in areas of fluid turbulence and low temperature physics, he coordinates a number of research and training programs with external partners, including the Central European Initiative's Science and Technology Network, the Italian Institute for Nuclear Physics (INFN), and the International Society for Optics and Photonics (SPIE). He is a member of the teaching faculty of the University of Trieste Doctoral School in Environmental and Industrial Fluid Mechanics and besides teaching he serves on its Entrance Examination committee.

Dr. Niemela also serves as a board editor for Papers in Physics and the African Review of Physics. He is a member of the European Physical Society's Physics for Development Board, and represents the ICTP on the International Commission for Optics' Education Committee.

Dr. Niemela is currently Director of the UNESCO's Active Learning in Optics and Photonics Program--an undergraduate level teacher training program-- and also serves as the ICTP liaison to UNESCO's Division of Basic and Engineering Sciences. In addition, he represents ICTP at the SESAME Council and is a member of the SESAME Training and Advisory Committee (TrAC).



RICHARD M Q BROOKS

Director
FD Solutions
London, UK

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Email: richard.brooks@fdsolutions.uk.com

Since co-founding FD Solutions (www.fdsolutions.uk.com) in the early 1990s, Richard has been integral to FD Solutions becoming the leading provider of flexible Director services in the UK.

In addition to Finance Directors the company also provides HR Directors and Sales Directors.

Specialist sectors include technology start-ups, food, retail, manufacturing and not-for-profit organisations. In addition to helping technology start-ups with financial and business planning he also has invested in a few.

Richard, who qualified as a Chartered Accountant with Ernst & Young in 1984 is also:

Vice-chairman of PraxisUnico (<http://www.praxisunico.org.uk>) the educational not-for-profit organisation supporting innovation and commercialisation of public sector and charity research for social and economic impact.

Board member of the Bio Industry Association Finance and Taxation Committee
<http://www.bioindustry.org/advisory-committees/finance-and-tax-advisory-committee-ftac/>

Presenter on IOP entrepreneurship workshop
http://www.iop.org/about/international/development/entrepreneurship/page_44527.html

Member of the advisory board of the London Chamber Orchestra, <http://www.lco.co.uk/about/trustees-and-advisers>



Tony Bunn PhD

(Medical Science)

Director

MRC Innovation Centre

MRC Medicina Campus

South Africa

Email: tony.bunn@mrc.ac.za

Tony is Director of the Innovation Centre of the South African Medical Research Council (MRC) that manages innovation opportunities from MRC research discovery. He has recently formed the MRC-University Medical Device Innovation Platform (MDIP), a collaborative endeavour to utilize the R&D expertise at universities to bring appropriate medical devices to market.

He was previously an associate professor and acting head of the department of biomedical engineering at the University of Cape Town and currently holds an honorary professorship with the university. He is also an extraordinary professor at the Central University of Technology. Tony is frequently invited to speak on technology transfer, entrepreneurial and innovation issues at both national and international meetings. His own research has led to the formation of five start-up companies, all based on securing critical IP. He is also a Director of 3 MRC spin-out companies.

Together with the international organisation, MIHR, Tony co-founded the African Programme for Health Innovation involved in capacity development in technology transfer in southern and east Africa. He is also a co-founder and member of the Southern African Research & Innovation Management Association (SARIMA) and actively participates in the national innovation agenda.



Fulvia Farinelli

**Enterprise Development Branch
Division on Investment And
Enterprise (DIAE) - UNCTAD
Geneva, Switzerland**

<http://www.unctad.org/enterprise>

Email: Fulvia.Farinelli@unctad.org

Fulvia Farinelli works at UNCTAD in the Division on Investment and Enterprise Development since 1998. Her academic background focuses on issues related to entrepreneurship and development, including innovation and global value chains.

Before joining UNCTAD, she was a researcher in Rome at the Directorate for Studies of the Italian National Agency on New Technology, Energy and the Environment (ENEA), where she undertook several studies on innovation and technology in traditional sectors and was involved in large EU-financed projects for industrial upgrading in the Mercosur region. After joining UNCTAD, she became responsible for UNCTAD's entrepreneurship development programme — Empretec — in Latin America. Subsequently, she was also put in charge of technical assistance projects for developing soft entrepreneurial skills and for creating business linkages between transnational corporations and local suppliers in African and Asian developing countries.

She holds a Master degree in International Economic Relations from the Rome-based LUISS University and a PhD on Economic and Policy Studies on Innovation and Technical Change from Maastricht University, the Netherlands.



Yumiko Hamano

**IP and Business Consultant,
ET Cube International**

Email: yhamano309@gmail.com

Yumiko Hamano, a national of Japan, has extensive experience in the field of intellectual property (IP) in particular, patents, Patent Cooperation Treaty (PCT) System, university intellectual property management, university intellectual property policies, technology transfer, technology commercialization, entrepreneurship and technology based business strategies.

Until April 2013, she had worked as senior official for over 27 years at World Intellectual Property Organization (WIPO), Geneva based United Nations' specialized agency, responsible for the promotion of intellectual property systems and protection of intellectual property rights worldwide.

Together with two other partners, she has now founded a consulting and training company "ET Cube International" providing training and consulting services on intellectual property policies, intellectual property management, technology transfer, intellectual property commercialization and technology based entrepreneurship in collaboration with various international organizations including government institutions. She is a frequent speaker and lecturer in international conferences and professional training.

In addition to her technical expertise she has solid diplomatic skills built over her long experience in working in the United Nations Organization and organizing more than 150 international conferences and workshops through negotiation and coordination with governments and inter-governmental organizations, in particular, major and middle size Intellectual Property Offices and Ministries in charge of Science, Technology, and Innovation.

LLM Intellectual Property Law: University of Edinburgh, United Kingdom
MBA specialized in Management in International Organizations: University of Geneva, Switzerland

Languages:

Fluent: Japanese, English and French (UN language proficiency certificate)

Good command: Chinese (UN language proficiency certificate)



Dawood Parker

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Dawood Parker read Physics and Mathematics at the University of Cape Town and obtained his PhD in Physics at Southampton University. He was a lecturer in Medical Physics in University College, London where he founded and was appointed Director of the Medical Instrumentation Unit, a research group which collaborated with and was supported by industry. He played a significant role in the development of continuous invasive and non-invasive techniques used in the care and management of pre-term infants. In 1978 he spent a year as a consultant at Critikon Inc., Irvine, California, (a Johnson and Johnson company), where he was involved in the research, development and production of sensors for patient monitoring.

He became a Fellow of the Institute of Physics in 1985. In 1986 he was awarded a personal chair in Physics in the University of Wales, Swansea, where he was the Director of the Biomedical Sensors Unit.

From 1984 to 1989 he was Consultant Director of Research and Development, Novamatrix Medical Systems Inc, Wallingford, Connecticut. He has been a consultant to a number of major pharmaceutical companies.

In the last few years he has been involved in university-industry collaboration and has initiated a number of start-up companies which have resulted in the launch of successful patient monitoring instrumentation. Three of his start-up companies were acquired by major international pharmaceutical companies. He is currently Managing Director of Melys AFS Ltd and Melys Diagnostics Ltd, both of which companies are involved in the development of non-invasive patient monitoring systems.

He has published many scientific papers and holds a number of patents. He was awarded the MBE in 2013.



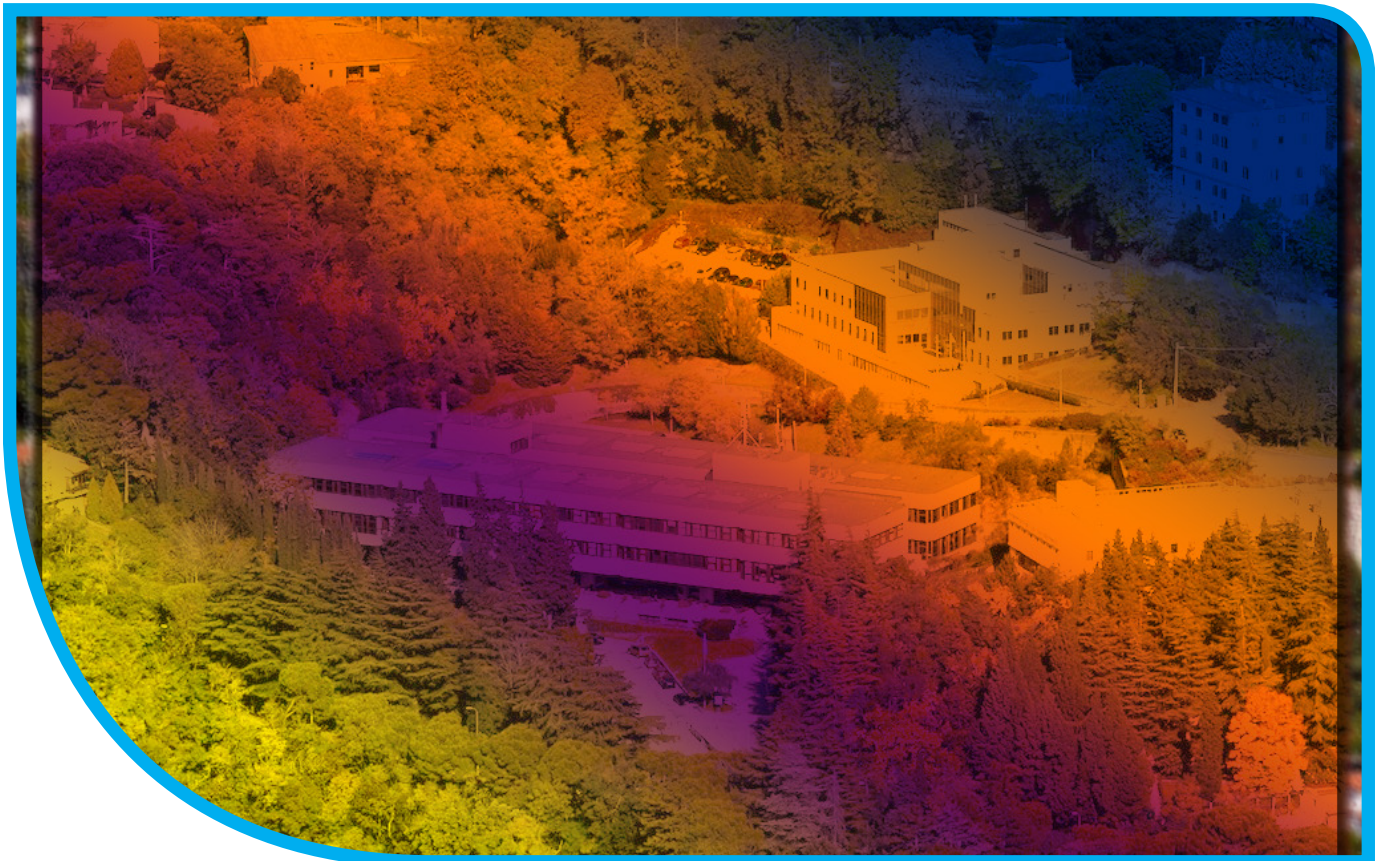
Beth Taylor

**Director of Communications and External Relations
Institute of Physics, London, UK**

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Beth Taylor is Director of Communications and External Relations at the Institute of Physics (IOP), responsible for the Institute's relationships with stakeholders in the UK and internationally, including media relations, public affairs, science outreach activities and web developments. She also leads the Institute's international activities, including the physics for development programme which supports education and training for physicists in the developing world.

Beth was previously Head of Communications for the UK Atomic Energy Authority. She has a BA and PhD in earth sciences from Cambridge University, and worked in the UK and USA as a civil servant, an energy analyst and a corporate strategist before moving into communications.



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