PROFESSOR ABUL HASAN SIDDIQI
Ex-Pro-Vice-Chancellor

Prof. Abul Hasan Siddiqi has started his academic career after obtaining post-graduation in Mathematics in 1962 and subsequently Ph.D. degree in 1967. Since then he is actively engaged in teaching and research of diverse areas of mathematics and its applications such as Functional Analysis, Approximation Theory, Variational Inequalities, Wavelet and Gabor Analysis with Their Applications to Finance, Car Industry, Meteorological Data Analysis and Oil Industry. He has served the Aligarh Muslim University in different capacities between 1965 and 1998 such as Chairman, Department of Mathematics, Provost of a Prestigious Hall of Residence, Dean, Faculty of Science, Pro-Vice Chancellor and even as the Acting Vice Chancellor. In view of his valuable contributions, he is the only person whose name was recommended continuously 3 times by the Executive Council of the Aligarh Muslim University for its Vice Chancellorship position. He has held visiting assignments in different parts of the world including the USA, Canada, Germany, Saudi Arabia, Oman. He has visited practically all industrialized nations for giving lectures and participating in International Conferences. He has actively collaborated with few distinguished German Professors such as Prof. Dr. Helmut Neunzert and Prof. Dr. Martin Brokate. He has been associated with Dr. Abdus Salam International Center of Theoretical Physics, Trieste, Italy (UNESCO Organization) since 1987 in different capacities such as short and long time visitor, Regular Associate, Senior Associate, ICTP Consultant to Turkey and 7 times as the guest of three former Directors and current Director. He has benefited a lot from these activities. He has acted as experts for selection committees of Professor in different Universities of India and Saudi Arabia (King Fahd University of Petroleum and Minerals).

He has acted as advisers to interview boards of the Union Public Service Commission, Shahjahan Road, New Delhi, Rajasthan Public Service Commission, Jammu & Kashmir Public Service Commission, Bihar Public Service Commission and Madhya Pradesh Public Service Commission.

He has acted as an expert for selecting candidates for Commonwealth Fellowships, Fulbright Fellowships and Hungarian Fellowships. He has supervised more than two dozen PhD students, who are holding now important positions in different parts of the world

He has published more than 100 research papers which have been extensively cited by other researchers in his field of specialization. He has published 4 post-graduate level books, publishers are Tata McGraw Hill, Marcel Dekker New York (now Chapman & Hall/CRC Press, Taylor Francis Group), Kluwer Academic Publishers (now Springer) and Taylor and Francis. He has edited 8 International Conference Proceedings published by Longman/CRC, London; Kluwer Academic Publishers, Boston-Dordrecht-London; Narosa, Delhi-London;

McMillan India, Bangalore-Delhi-Madras; World Scientific Publisher, Singapore; American Institute of Physics, USA and Anamaya, New-Delhi. He has been Visiting Professor in Tabriz University, Iran (December 1973-August 1975); Constant University, Algeria (1980-1983); Kaiserslautrn University, Germany (April 1997-October 1997); McMaster University, Canada (March 1996-May 1996). He has visited various Universities of Europe and North America to deliver invited talk such as Tennessee University, USA; Concordia University, Canada; Laval University, Canada; Erlangen University, Manheim University, Trier University, Heidelberg University, Darmstadt University (All Germany); Rome University, Pavia University, Pisa University etc. (all Italy); University of Brussel, Belgium; Nice-University, Paris University (Orsay Centre), both France.

He is a member of the International Council of Industrial and Applied Mathematics since 1999. He is the recipient of the German Academic Exchange Programme Fellowship thrice. He has been Professor of Mathematics at the King Fahd University of Petroleum and Minerals (KFUPM), Dhahran Saudi Arabia during the period 1998-2007. He was also Director of a research Lab for Wavelet and Variational Methods in KFUPM.

He has been Visiting Consultant to the Sultan Qaboos university, Muscat, Oman in 2009, 2010 and 2011. He has been research project consultant of famous oil company, ARAMCO, Dhahran, Saudi Arabia and research projects of Sultan Qaboos University, Oman and Koceali University, Turkey and Malaysian Institute of Micro-Electronic Systems (MIMOS), Malaysia in last couple of years.

While in AMU, he organized fairly good number of reputed conferences with the financial support of NBHM, CSIR and ICTP. In 2009, he organized an International Conference on Modeling of Engineering and Technological Problems in Agra with the financial support of AICTE, NBHM, ICTP, ICIAM, CSIR, INSA and Sharda Group of Institutions. More than 30 distinguished experts participated from abroad. The Proceedings of this conference was published in August 2009 by the American Institute of Physics, Melville, New York, USA (Editors A H Siddiqi, A K Gupta, M Brokate).

He has published more than 40 papers in last 6 years in reputed journals like Chaos, Soliton and Fractals (volume 39 and 40, pp 164-189, pp 181-190), besides 4 Proceedings of International Conferences and 3 books.

He is the chief editor of Indian Journal of Industrial and Applied Mathematics (an organ of ISIAM). Recently, a special issue of this journal dedicated to Prof Helmut Neunzert, famous Industrial and Applied Mathematician and founder of the biggest institute of Industrial and Business Mathematics, Kaiserslautern, Germany has been published. Contributors in this issue include eminent applied mathematicians like Prof. Illner of Canada, Prof. R A Klar of Germany, and Dr.

Benjamin Seibold of USA. This was released by Dr. Ved Prakash, Chairman University Grants Commission, New Delhi, India on 28 April 2013.

Currently, he is guiding 8 PhD students of Sharda University and helping researchers in Northern part of the country in many ways. He was invited to organize a thematic symposium in ICIAM 2011 at Vancouver in 3 sessions on Applications of Wavelets to Meteorology and Oil Exploration. Besides him, there were 10 other speakers from different countries. His visit to ICIAM 2011 at Vancouver, 17-24, July 2011 was sponsored by the National Board of Higher Mathematics, Department of Atomic Energy, Government of India. A Volume based on this thematic mini symposium has been published by the American Institute of Physics, Melville, New York, 2012 (Volume 1463).

He was on deputation to the Gautam Buddha University (adjacent to the Sharda University) from 15 October 2011 to 09 January 2013, but continued to supervise research scholars of Sharda University and also taught compulsory courses for PhD students.

He has supervised the PhD work of more than 30 candidates who received their degrees from different universities.

In the last three years he has been involved in the following activities:
1. Visited Technical University Munich, Kaiserslautern University, Research Institutes in Czech Republic and ICTP during the period May to June 2010 to establish research collaboration of Sharda University with these institutions.

2. Organized a Satellite Conference of ICM 2010 (International Congress of Mathematicians 2010) on "Mathematics in Science & Technology" at India Habitat Centre, New Delhi, India. It was attended by thirty representatives of different societies of the world working for promotion of Industrial and Applied Mathematics. (Including Society of Industrial and Applied Mathematics, USA) besides 250 delegates from India and abroad. The conference was inaugurated by the present Minister of Foreign Affairs of India, Honorable Mr. Salman Khursheed. The Proceeding of this conference has been published by the World Scientific Publisher, Singapore (Editors A H Siddiqi, R C Singh and P Manchanda).On this occasion a workshop on Wavelets and Inverse Problems was also organized by him in collaboration with Dr. Ms. Mani Mehra of IIT Delhi and supported by DST. Leading experts participated. A full report on this conference is printed in International Council of Industrial and Applied Mathematics (ICIAM) news letter April 2013 (available at http://www.iciam.org/news). The board meeting of ICIAM 2010 was held at India Habitat Centre, Lodhi Road, New Delhi prior to this conference and he was the main host.

3. Visited Baba Gulam Shah BadShah University, Rajouri, Jammu& Kashmir in the last week of March-2012 for delivering series of lectures attended by M.Sc., M.Phil and PhD students and faculty members of Mathematics, Computer Science and Electronic & Electrical Engineering. Also delivered the key note address at the inaugural function of a National Conference organized by that university.

4. Delivered a talk on "Data Mining and Inverse Problems" during a Workshop at **Kyoto University, Japan** on 31 May and 1 June, 2012, Maskawa Hall (Comprehensive Education and Research Building), **Kyoto University, Japan.**

5. Attended the **board meeting** of ICIAM 2012, at Kyoto University on June 2, 2012.

6. Visited **New York University**, New York, USA on 5 June 2012 and was received by **Prof. K R Sreenivasan, Former Director ICTP**, Trieste, Italy (UNESCO organization) and currently a senior functionary of the New York University. He expressed his willingness to provide all possible academic help to researchers of Gautam Buddha University and Sharda University including providing more recent books published in emerging areas of Applied Mathematics, Physics and Engineering (in fact he asked him to pick books of Springer Verlag and he brought 6 such books). Such books are not easily available.

7. Visited **Rochester Institute of Technology**, Rochester, USA from 6 June to 13 June 2012 and interacted with researchers of that institutions engaged in the study of "Inverse Problems". Delivered a lecture of one hour duration on Applications of wavelet Methods to Inverse Problems on 12 June, 2012. He also attended a lecture by **Prof. Hoffman of Germany** visiting RIT during that period. He is an authority on Inverse Problems. Long discussion with him may prove quite beneficial for future research.

8. On 18 June 2012, he visited **Prof. Victor Isakov of Wichita University**, USA, who is also associated with the Courant Institute of Mathematical Sciences, New York University. He presented him some of his current reprints and preprints on Applications of Inverse Problems to diverse fields of Financial Engineering, Medical Sciences and Technology along with a xerox copy of his book on Inverse Problems published by American Mathematical Society (currently it is out of print).

9. He was nominated as one of the Chair Person of 6th International Conference on Image Processing during 28 to 29 September, 2012, Istanbul, Turkey held at 160 years old university (BOGAZICI) and delivered plenary lecture in that conference.

10. Organized an International Conference on "Emerging areas of Mathematical Methods, Models and Algorithms" in the mathematics year 2012 in India (declared by the Prime Minister of India) to commemorate 125th birth year of mathematics wizard Srinivasa Ramanujan during 14 to 16 December 2012 at Gautam Buddha University, (National Capital Region), India. More than 200 distinguished mathematician and engineers participated in this conference including Prof. Krishan Lal, Indian National Science Academy, Prof. Dinesh Singh, Vice-Chancellor, Delhi University, Prof Martin Brokate, Technical University, Munich, Prof. R Lozi (Nice University, France, famous for Lozi attractor), Prof U B Desai, Director IIT, Hyderabad, Prof Venkateswaran P. Krishnan, Prof Gaik Ambartsoumian of University of Texas. He has edited the Proceedings of this Conference jointly with Prof. Manchanda etc.

11. Initiated a book writing project on Inverse Problems with Applications to Science and Technology jointly with Prof. P Manchanda of Guru Nanak Dev University, India. They have already consulted several leading workers of the field such as Prof. M Z Nashid, UCF, USA, Prof. A A Khan of Rochester Institute of Technology, USA. Prof. Hoffman of Germany, Prof. V Isakov, USA: the project is continuing.

12. Delivered invited and memorial lectures at Delhi University and Rohtak University (Haryana) in a yearlong celebration to commemorate 125 birth year of Srinivasan Ramanujan.

13. Designed a model syllabus for M.Sc. Applied Mathematics with specialization in Industrial Mathematics, Financial Mathematics and Scientific Computing in consultation with 25 well known applied mathematicians of India. This has the approval of Indian Society of Industrial and Applied Mathematics. (Available at www.siam-india.org.in, www.isiam.org)

14. Delivered a talk on "Image Denoising of Biomedical Images Using Discrete Shearlets", during "Workshop on Industrial and Applied Mathematics", May 10, 2013, Institute of Mathematical Sciences and System Analysis, Conference Hall, Ground Floor, Siyuan, AMSS, **Beijing, China.**

15. Attended Board Meeting of ICIAM, on May 11, 2013 at Jade Palace Hotel, Beijing, China.

16. Visited **MIMOS, Kuala Lumpur, Malaysia,** delivered an invited talk and interacted with researchers on May 7, 2013.

17. The following research scholars of Sharda University, NCR, India are currently working under his supervision on the topics mentioned against

their names. He is also collaborating with Prof. Ms. P Manchanda of Guru Nanak Dev University, Amritsar, India and with her research team

- Ms Noor-e.Zahra   Supervisor   Image Processing with Curvelets and Shearlets
- Ms Asia Batool   Supervisor   Black Scholes Model of Financial Mathematics
- Mr Padmesh Tripathi   Supervisor   Inverse Problems for Partial Differential Equation
- Ms Amita Garg   Supervisor   Regularization Method for Inverse Problem
- Ms Nagma Irfan   Supervisor   Wavelets for Data Mining
- Ms Puja Garg   Supervisor   Inverse Problem for Parabolic Equation
- Ms Arti Malik   Supervisor   Inverse Problems for Epidemic Models
- Ms Ruchira Aneja   Supervisor   Image Processing with Shearlets
- Mr Nitendra Kumar   Co-Supervisor   Matrix Techniques in Data Mining
- Ms Neelam   Co-Supervisor   Wavelet Methods in Time Series Analysis

He is also guiding research scholars of JMI, New Delhi.

18. **Stay at MIMOS, Kuala Lumpur, Malaysia as a Consultant from September 2, 2013 to January 16, 2014.** MIMOS is the premiere Institute of Applied Sciences under the Ministry of Science and Technology, Govt. of Malaysia. During his stay there, he indicated future directions of research on themes like Software Defined Networking, Applications of Wavelet Methods to Biometrics for Identification of Persons, Graph Database Semantics and Management of Big Data. These are the emerging topics of Applied Sciences, especially of Computer Science and Information Technology. He delivered talks on these themes and interacted with researchers there, especially with a senior scientist, Prof. K Arichandaran. His collaboration with this institute will continue for longer duration.

CONTRIBUTION AS PRO-VICE CHANCELLOR

Prof. Abul Hasan Siddiqi joined as the Pro-Vice-Chancellor (PVC) of AMU on 31 May, 1992. He was appointed the PVC not merely being an eminent expert of his field but also as a very able administrator. He was associated with the administration of AMU in different capacities since long and was one of the few faculty members, who because of their intimate knowledge of the history, ethos and character of the University, possessed a deeper insight into its problems. He was widely known for his dynamism and administrative acumen, qualities of leadership

and stamina to work incessantly. He was popular among students and staff alike and commanded esteem from the broader spectrum of the University Community. He was well known for his quick impartial and correct decisions during his tenure of PVC. He worked very hard for over all development of the University. Besides routine work of the administration, teaching and guidance of research, he made sincere efforts to enhance AMU welfare fund and AMU development fund. He managed financial support to the university from the other sources than the UGC, for example, Welfare Ministry, Agriculture Ministry, Ministry of Science and Technology and private donors such as Engg. Nadeem Tareen. He played significant role in starting new professional courses in Faculties of Science, Commerce, Arts etc. Construction of Indira Gandhi Hall, Nadeem Tareen Hall, Ambedkar Hall, Working Women's Hostel, Obaid-ur-Rehman Khan Sherwani Hall, Architecture Department, Agriculture Faculty and Ambedkar Chair are typical outcomes of his untiring efforts. His administrative quality was reflected on many occasions, such as, during the turmoil caused by the demolition of Babari Mosque (AMU remained free from any untoward incidents as he and a large number of faculty members on his request were present at crucial points and occasions) and the road accident and firing thereafter near Shamshad market. After the expiry of his tenure of PVC, he went to Germany and Italy and subsequently accepted a prestigious offer of the KFUPM for the post of Professor in senior scale in early 1998 and served there for about ten years.

It is a rare honor for any individual that his name is recommended thrice during the period of nine years for the highest administrative position of AMU by the executive council.

ASSOCIATION WITH DUTY SOCIETY

Alhaj Obaidur Rehman Khan Sherwani, a legendary figure of AMU and Aligarh Educational Movement, motivated him to join the Duty Society in 1975. Dr. Hashim Kidwai (former member Rajya Sabha and the then Keeper of the Duty Society), encouraged him to take up the responsibilities of the society. After Dr. Kidwai become quite involved in political activities in Delhi as a member Rajya Sabha, the executive committee of the Duty Society unanimously elected him Keeper of the society in 1986. Under the able guidance of Alhaj Obaidur Rehman Khan Sherwani and Patronage of Mr. Syed Hashmi Ali, VC AMU and Prof. Moonis Raza, VC, DU, the Duty Society reached to the height of its glory when its centenary function was organized in the Vigyan Bhavan on 21 March, 1989. Keynote address by Prof. M Shafi (Ex-Pro-Chancellor, AMU), on 08 February 2004 at India International Centre on Dr. Zakir Husain life and work seminar, provides details of the activities of the Duty Society during 1985 to 2004. Notable achievements of the Duty Society in the recent past are establishment of Coaching and Guidance Centre, Computer Centre, Construction of a spacious building for activities of the Duty Society, Nadeem Tareen Hall, a Wing in Indira Gandhi Hall, Construction of few rooms in Habib Hall, Habib Hall Mosque and Organization of Dr. Zakir Husain – Life and Work Seminar at India International Centre,

February 2004 (Honorable Mr. I K Gujral, former Prime Minister of India was the Chief Guest) and seminar on Modern Technical Education for Minorities at India Habitat Centre, New Delhi (Honorable Mr. Wajahat Habibullah, Chairman Minority Commission and Dr. Ved Prakash, Chairman UGC among the dignitaries were present on this occasion) on 28 April, 2014.

He may be credited with rejuvenation of the Duty Society, AMU (www.dutysociety.org) and establishment of the Indian Society of Industrial and Applied Mathematics (www.siam_india.org) representing India at the Apex body of the world, International Council of Industrial and Applied Mathematics (www.iciam.com).

ACADEMIC COLLABORATIONS AT NATIONAL AND INTERNATIONAL LEVEL

Professor Abul Hasan Siddiqi was a leading spirit behind the satellite conference ICM-2010 on "Mathematics in Science and Technology" 15-17 August 2010 and the workshop on "Inverse Problems and Wavelets with Applications to Real World Systems" on 14 August 2010. He is the founder secretary of Indian Society of Industrial and Applied Mathematics and has done yeoman service in establishing and expanding its activities. Academic collaboration of Prof. Siddiqi with researchers of different countries of the world in the emerging areas of mathematics and his endeavor to promote emerging areas of Mathematics in different parts of the world is summarized below.

He has collaborated at different levels with researchers of various areas in countries such as Germany, USA, Canada, France, Italy, Belgium, Hungary, Turkey, Saudi Arabia, Uzbekistan, Algeria, Iran, Oman, and Kuwait.

In June 1971 he was awarded a German Academic Exchange programme fellowship to work with Prof. Horst Leptin at Heidelberg University (Angewandte Institute of Mathematik). While in Heidelberg, he learnt contemporary trends in abstract Harmonic Analysis. He also availed his visit to work with Dr. S. Gaehler of German Academy of Sciences, Berlin to learn 2-dimensional analogues of Banach and metric spaces known as 2-metric and 2-Banach spaces. After return from Germany, he delivered lectures on these themes in different conferences in India and Iran. Many Indian and Iranian researchers started working in the areas of 2-metric and 2-Banach spaces. He jointly with S. Gaehler and S C Gupta published a paper in Mathematische Nachrichten on "Contributions to Non-Archimedean Functional Analysis", besides several papers joint with Prof. Esfahanizadeh, (Tabriz), Ahmad Khan, Ataullah Siddiqi, Mohiuddin (India), Mohammad Zadeh, Subhan Allahi (Tabriz University). Prof. Siddiqi was visiting Professor of Tabriz University, Iran from Dec. 1972 to August 1975, supervised the work of M.S. Dissertation and initiated the research programme. He himself benefitted from the contact with distinguished mathematicians invited in the annual conferences of Iranian Mathematical Society in 1973, 1974, 1975. Between

1975 and 1980, Professor Siddiqi took effective steps to propagate research activities in 2-Normed spaces, Non-Archimedean Functional Analysis and Walsh Fourier Analysis. To achieve this goal he invited Prof. Grand de Kimpe of Belgium to AMU who spent a month in India and delivered series of lectures.

In the area of Walsh-Fourier analysis he collaborated with a distinguished Professor of Electrical Engineering, Prof. M U Siddiqi in AMU who was subsequently HOD of Electrical Engineering of IIT Kanpur and now in Malaysia. He learnt from him Application of Walsh-Fourier Analysis to Differential Equations and other engineering problems. During the above mentioned period he established an interdisciplinary research group and persuaded a mechanical engineering professor to guide a student of mathematics in fluid mechanics.

Between 1980 and 1983 he worked as a Professor in the Constantine University of Algeria under the Indo-Algerian agreement and was Incharge of the research activities of mathematics in the University Research Centre. Several faculty members and post graduate students worked with him such as Dr. Sherif, Prof. Abu Bakar Marouni (Subsequently he became Vice-Rector of Setif University), Dr Yasin Chweiter, Dr. Merhoun, Dr Mustafa. During his stay in Algeria, he was motivated by French mathematicians Prof. L. Tartar (University of Paris), late Prof. (Ms.) J Boujot of Orlean University and Prof. R. Lozi (CNRS, Nice) to work in the areas of Variational Inequalities, optimization in Hilbert Spaces and Optimal Control. He pursued these fields rigorously in subsequently years. After returning to India, he was sanctioned a major research project of CSIR on Variational Inequalities in which one of the well known Professor (Prof. Q H Ansari) worked as a research fellow. On the initiative of Prof. Siddiqi and late Prof. (Ms.) J Boujot, an Indo-French workshop and conference was organized in May 1985 at TIFR centre, IISC Bangalore for about 3 weeks by NBHM. Several distinguished French Researchers in PDE in general and Variational Inequality in particular delivered lectures and interacted with the participants. Many beneficiaries of this conference and workshop are well known mathematicians of the present day.

Between 1985 and 1998 he took several steps to establish research collaboration between AMU and other institutions such as Orlean Univeristy, France, Kaiserslautern University, Germany, McMaster University, Canada, Tenesse University, Knoxville, Concordia University, Canada, Laval University, Canada, Universities in Rome and Pisa. He could establish effective contact with Prof. Helmut Neunzert group at Kaiserslautern Germany. Since 1990 Prof. Neunzert and his colleague Prof. Brokate visited India several times and interacted with Indian researchers not only from AMU but from Allahabad University, Guru Nanak Dev University, IIT Delhi, Chennai, Roorkee, Bombay, Kharagpur and IISC Bangalore etc. A fairly good number of Indians were trained at Neunzert's group who are now occupying good positions in the different parts of the world and engaged in research of applied nature. One notable beneficiary is Dr. Akhtar Khan of Rochester Institute of Technology who was inspired by Prof. Siddiqi.

As pursuance of his objective he could arrange visits of Prof. U Mosco (Rome & now USA), Prof. F Giannessi (Pisa), Prof. A. Bensoussan (Paris) Prof. R Lozi (Nice) and Prof. R T Rockafellar (USA) to AMU besides visits of several young researchers of Europe and USA. Professor Siddiqi visited different universities is US and Canada such as University of South Florida, Duquesne University, University of Tennessee, McMaster University and Laval University in March – April 1991. Prof. Siddiqi had close contact with Prof. T Hussain of McMaster University. Prof. Hussain visited several times to AMU between 1985 and 1996. Prof. Siddiqi was a guest of honor in the function arranged at the time of his retirement in May 1994. On this occasion an international conference was organized by the Department of McMaster University which was attended by distinguished Functional Analysis including Walter Rudin. The Proceedings of this conference has been published in Pitman Res. Notes Math. Ser.

Between 1989 and 1999, Prof. Siddiqi visited Kaiserslautern University practically every year and made several valuable research contribution in the form of research papers, a book on "Topics in Industrial Mathematics-Case Studies" jointly with H. Neunzert, Kluwer Academic Publisher, 2000 and an edited volume jointly with Prof. Martin Brokate entitled "Functional Analysis with Applications" Pitman Res. Notes Math. Ser. , Longman/CRC 1998. On the initiative of Prof. Siddiqi and Prof. Neunzert a workshop on Industrial Mathematics sponsored by UGC was organized in Delhi in Feb 1999 in which thirty HOD's of Universities in Northern India participated and benefited from the delibration of this workshop. Some other Senior Indian Professors working on the Applications of Mathematics to real world problems also participated in this workshop. Prof. Neunzert and his co-workers along with Prof. Engle and Shashi Maier delivered lectures in this workshop.

Prof. Siddiqi had visited several institutions in Germany but his visit to Prof. J. Zowe at Erlangen proved very useful as he could collaborate with Prof. M. Kocvara. Prof. Siddiqi and one of the authors (Prof. Manchanda) could write a paper in the area of financial mathematics entitled "Two-Step Algorithm for American Option Pricing" published in IMA Journal of Business and Industry 2000. They also wrote a paper on Wavelet based solution of Black-Scholes Model of Option Pricing. Prof. Siddiqi and Prof. Kocvara edited the proceedings of ISIAM annual conference in GNDU, Amritsar, January 2001 published by Kulwer Academic Publisher, 2002. The proceeding contains some valuable papers by P L Butzer, J R Higgins, G Fairweather, N I Gould, P Toint, P N Shivakumar et al. All are leading workers in the field of specialization

ASSOCIATION WITH INTERNATIONAL CENTRE OF THEORETICAL PHYSICS (ICTP)

Prof. Siddiqi has continuously visited ICTP Trieste Italy, UNESCO organization since 1987 in various capacities such as federation arrangement, Visiting Mathematician, Short Time Visitor, Regular Associate, Guest of the Director, Senior Associate. He has been also appointed as the visiting scholar/consultant

(office of external activities) to Istanbul, Turkey for the period 2007-2010. Visits to ICTP enabled Prof. Siddiqi to collaborate with scientists of the different developing countries of the world including India in a congenial atmosphere. During his visits he could work with Prof. Zafer Aslan of Turkey (Istanbul) and Prof. Rasulova Mukhayo of Uzbekistan (Tashkent) and has published several joint papers. He is Co-Chair of International Workshop on Wavelets and Applications organized in Istanbul since 2005. He has motivated many researchers in Turkey to work in the Applications of Wavelets to Real World Problems. Proceedings of these workshops are published every year.

STAY OF PROF. SIDDIQI AT KFUPM (SAUDI ARABIA)

Prof. Siddiqi was invited to give series of lectures at King Fahd University of Petroleum and Minerals (KFUPM), Dhahran, King Saud University, Riyadh and Umm-Al-Qura University, Mecca in May-June 1998. At the end of the visit, the KFUPM offered him a post of Professorship which he accepted and joined in the first week of October of the same year. It may be noted that this university was established by the largest oil company of the world ARAMCO in 1963 adjacent to its premises in Dhahran (Saudi Arabia). It is considered as one of the best universities of the developing countries. Its campus facilities and library can be easily compared to a few best universities of the world. Prof Siddiqi stayed in KFUPM till 2007/2008. During this period of about 10 years he collaborated with Prof. K M Furati (Former HOD of the Department of Mathematical Sciences), Dr. Tawfiq Hattan (Present HOD of the Department of Mathematical Sciences), Prof M. El Gebeily, Prof Al-Homidan (Current Dean, Faculty of Science, KFUPM), Dr. M A Sohail, Dr. Fauzi Khene, Dr. Aiman Mukheimer, Dr M. Feroz, Mr Samsuddin Khan, Mr S. Rehman. During his stay he wrote 44 research papers, 3 books and edited proceedings of 5 International conferences, all published by reputed publishers of the world. The proceedings were co-edited by Prof. I.S. Duff, Dr. O. Christensen, Dr. M. Kocvara, Prof. K. M. Furati and Prof. M. Z. Nashed et al. He was the **Lead Technical Editor** of "The Theme issue on Wavelet and Fractal methods in Science and Engineering" of the Arabian Journal for Science and Engineering in two volumes, volume 28(1C) 2003 and volume 29(2C) 2004. In these two volumes there are 25 contributors from different parts of the world, notable among them are S. Dahlke, G. Teschke, V. Wickerhauser, Dr. O. Christensen, C. Canuto, G. Naldi, K. Urban, P. Venini, D. Saupe, Maria Rosaria Lancia, F. Nekka. Prof. G. Korvin was the technical editor and the guest technical editors were Prof. U. Mosco, S. Dahlke and W. Freeden. Prof. Siddiqi was appointed the Director of the Research lab in Wavelet & Variational Methods of the Department of Mathematical Sciences KFUPM. He was also consultant in a major research project of ARAMCO completed by the research institute of KFUPM. This was a big project in which good numbers of experts of different disciplines were involved. Prof. Siddiqi has completed four research projects and one book writing project as the Principal Investigator during his stay in KFUPM. On his initiative several new courses at the under graduate and post graduate level were introduced. On his initiative an International Symposium on Industrial Mathematics was held in

February 2004 at KFUPM in which Dr. Noel Barton, Prof. Martin Brokate et al were invited speakers. Prof. H. Neunzert visited KFUPM twice on his initiative. Prof. H. D. Mittelmann of Arizona State University visited KFUPM for one month. Prof. A. H. Siddiqi was his visit coordinator. On his initiative Prof. K. R. Sreenivasan, Director, ICTP visited KFUPM and other institutions in Saudi Arabia.

Association with Sultan Qaboos University- Muscat, Oman

After returning to India in 2007/2008, Prof. Siddiqi joined the Sharda Group of Institutions and started collaborating with engineers in the areas of Wavelet, ANFIS and NeuroFuzzy method and their Applications to Medical Signals such as EEG, EOG, ECG and meteorological problems. During his stay at Agra, he visited Sultan Qaboos University, Muscat, Oman, thrice in 2009 first as a speaker in modeling conference in February, as a consultant in a research project of Dr. M. Boulbrachene in May and as a visiting consultant from September 2009 to January 2010. He is actively collaborating with Dr. M. Boulbrachene in the area of Numerical Simulation of Variational Inequalities, particularly Parabolic and Prof. M Al Lavati on Financial Mathematics.

AREAS OF MATHEMATICS PURSUED BY PROF. SIDDIQI AND HIS CO-WORKERS.

(i). Fourier and Dyadic Harmonic Analysis: Professor Siddiqi tried to popularize certain areas with which researchers in our country were not familiar. In sixties most of the researchers in northern India were engaged in the summability of Fourier series and special functions. Young Siddiqi tried to introduce to Indian researchers new areas such as classes of Fourier coefficients, approximation by Fourier Series and Orthonormal Systems other than Trigonometric System such as Walsh and Haar systems. He pursued vigorously Walsh Fourier Analysis and collaborated with engineers and Hungarian mathematicians F. Schipp, F. Moricz and S. Fridli. Prof. Moricz visited him thrice and has written two valuable joint papers while Fridli visited him once and had hosted him in Hungary. He has written recently a joint paper establishing fairly general results in the area of approximation by Walsh Polynomial. Prof. Schipp visited him twice in India, Prof. Sididiqi and his co-workers learnt from him Haar Vilenkin system. Prof. William Wade, USA visited him in India and also invited him to visit Tennessee University. He has cited the book of Prof. Siddiqi on Walsh function published by AMU Press 1978 and several of his results. Some of the results obtained by Prof. Siddiqi in these areas are given in the next section.

(ii). Two Dimensional Analogues of Banach Spaces: The concept of two dimensional analogues of Metric, Normed and Banach spaces were introduced and studied by Sigfried Gaehler of the German Academy of Science, Berlin around 1963. Prof. Siddiqi introduced this topic to researchers in India, Iran and Algeria.

He spent a month with Dr. Gaehler in Berlin. He wrote several papers on non-Archimedean (ultra) 2-matric and 2-normed spaces, quasi-normed spaces, 2-semi inner product spaces, orthogonality in 2-normed spaces, ultra m-metric and non-Archimedean m-normed spaces.

(iii). Non Archimedean Functional Analysis: Besides concepts of compact operators and fixed point in non-Archimedean functional analysis, Prof. Siddiqi introduced the concept of invariant means in non-archimedean Functional Analysis which is published in Springer Lecture Notes in Math. Vol. 399, Springer Berlin 1974.

(iv). Variational Inequalities: Variational Inequalities, introduced and studied by celebrated mathematicians like J L Lions, G Stampacchia, G Fichera in early sixties were not know in Indian Subcontinent till 1985. Prof. Siddiqi popularized this subject in Indian subcontinent and he guided successfully 10 research scholars in this area, many of them are very active researchers. He has studied applications of Variational Inequalities in some problems of Superconductivity and Elasticity (rigid punch problem) and wrote joint papers with his co-workers.

(v). Wavelet Theory: According to Professor Siddiqi wavelets were introduced to him by Prof. H. Neunzert while driving from Kaiserslautern to Darmstadt in June 1990. He tried to introduce this subject to his PhD students in early nineties in particular, and other Indian Researchers in general. Prof. Siddiqi joined KFUPM in 1998 and devoted his full time to promote study of Wavelet Theory and its Applications.

(vi). Fractals: He was motivated by a Distinguished Electrical Engineering Professor (Prof. M N Faruqi, Former Deputy Director IIT Kharagpur & Vice Chancellor AMU) in 1993 to take up the Study of Fractals and their Applications in Image Processing. He guided research in this area and one of his PhD students (Mr. Aiman Mukhimar) worked in this area, got PhD degree and now HOD of applied sciences in the Prince Sultan University, Riyad, Saudi Arabia.

(vii). Industrial and Financial Mathematics: Writings of Prof. H Neunzert inspired him to take up the study of industrial and financial mathematics. He has made serious efforts to initiate teaching and research of Industrial Mathematics in India. He established the Indian Society of Industrial and Applied Mathematics (SIAM) with the help of senior academicians of the country such as Prof. J.N.Kapoor, Prof. H P Dikshit, Prof. Izhar Hussain, Prof. U P Singh, Prof. D K Sinha, Prof. V P Saxena, Prof. G C Sharma, Prof. N K Gupta, Prof. Bhola Ishwar, Prof. Karmeshu, Prof. O P Bhutani, Prof. Rudraiah. He is credited for organizing Biennial Conferences of the Society and International Conferences since 1992. The proceedings of these conferences are published by reputed publishers. The society is publishing its journal of which Prof. Sididiqi is the Editor-in-Chief (see website www.siam-india.in).

(viii). Oil Exploration and Wavelets: Professor Siddiqi has worked on the role of Wavelets to Oil Industry as a Consultant in a research project of the largest oil company of the world – ARAMCO. He also completed two research projects on Applications of Wavelets to Meteorological Data of the Kingdom of Saudi Arabia (see Volume 1462 AIP USA).

(ix). Wavelets Inverse Problems and Medical Signals:

BOOKS AND EDITED VOLUMES OF PROF. A. H. SIDDIQI

I.   Books Published by Reputed Publishers

1. K. Adzievski and A. H. Siddiqi, Introduction to Partial Differential Equations for Scientist and Engineers using Mathematica ,Chapman & Hall / CRC Press, Taylor and Francis Group, U.S.,2013.

2. A H Siddiqi, P. Manchanda, M. Brokate, Calculus with Applications written under a project of ICTP, Trieste, Italy, IK International publisher, 2011.
3. A. H Siddiqi, Applied Functional Analysis, Anamaya Publisher 2010.
4. A. H. Siddiqi, K. Ahmad, P. Manchanda, *Introduction to Functional Analysis*, Anamaya/Anshan, New Delhi/London, 2006.
5. A. H. Siddiqi, P. Manchanda, *Introduction to Differential Equations*, Macmillan India, New-Delhi/Banglore, 2006.
6. A. H. Siddiqi. *Applied Functional Analysis.* Marcel Dekker, New York, 2004.
7. Helmut Neunzert and A. H. Siddiqi, *Topics in Industrial Mathematics, Case Studies and Related Mathematical Methods.* Kluwer Academic Publishers, Boston-Dordrecht-London, 2000. (Now Springer), electronic version will be available in 2014.
8. A H Siddiqi, Introduction and Functional Analysis with Applications, Tata McGrawHill, 1987 (under UGC book writing project)

9. A H Siddiqi, 'Walsh Function', AMU Press, 1978.

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1. A H Siddiqi Emerging Application of Wavelet Methods,Vol.1463, American Institute of Physics (AIP),USA,2012
2. A.H. Siddiqi, R. C. Singh, P. Manchanda, Proceedings of Satellite Conference ICM 2010 on Mathematics in Science and Technology,World Scientific Publisher, Singapore,2011.
3. A.H Siddiqi, A.K Gupta, M. Brokate, Models of Engineering and Technological Problems, American Institute of Physics (AIP), USA 2009.
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6. A. H. Siddiqi and M. Kocvara. Trends in Industrial and Applied Mathematics. International Conference Proceedings-Kluwer Academic Publishers (Now Springer) Boston, 2002.
7. P. Manchanda, Khalil Ahmad, and A. H. Siddiqi. Recent Trends in Industrial and Applied Mathematics. Anamya Publishers, New-Delhi/London 2002.
8. A.H Siddiqi and K. Ahmad. Mathematics and its applications in

industry and business Narosa, New-Delhi & London, 2000.

9. M.Brokate and A.H.Siddiqi,Functional Analysis with Current applications in science, technology and industry,Pitman Research Note in Mathematics series,Vol.377,Addison Wesley Longman,U.K,1998.
10. A. H. siddiqi, Applicable Mathematics, MacMillan, India, 1994

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