Professor Dr. Syed Arif Kamal

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Project Director, the NGDS Pilot Project[⊂]
Senior-Most Professor of University
Dean, Faculties of Science & Engg.
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PROFILE

My Philosophy of Life
While there is a will there is a way

NO handwritten notes except original signatures.
VOID unless bears original signatures on every page.
DATE and TIME of printing must match on every page.

Prof. Dr. Syed Arif Kamal, Senior-Most Professor of University, Head, Anthromathematics Group, Department of Mathematics, Dean Faculty of Science and Caretaker Dean, Faculty of Engineering, University of Karachi, obtained his BSc (Honors) *summa cum laude*, MSc *summa cum laude* (98.8% aggregate marks) and PhD from University of Karachi, MS from Indiana University, Bloomington, United States and MA from the Johns Hopkins University, Baltimore, United States as Quaid-é-Azam Scholar. He held visiting and sessional faculty positions at the Albert Einstein College of Medicine, New York, United States, Malmö General Hospital, Malmö, Sweden and the Aga Khan University Medical Coillege, Karachi.

His awards and honors include throughout First-Class-First Position and 4 gold medals for scholastic achie-vements as well as Karachi-University-Syndicate Appointments as Assistant Professor, Associate Professor and Professor, all of them number one according to merit list. He is a member of the American Institute of Aeronautics and Astronautics (AIAA), the International Brain Research Organization (IBRO), the Karachi Uni-versity Senate, Academic Council and Boards of Faculty (Science, Arts and Education). As member of Expert Panel on Curriculum of Mathematics, Ministry of Education, Government of Pakistan, he reviewed mathematics syllabi and textbooks for Classes I-XII. He acts as Subject Expert (Mathematics) on the Selection/Interview Boards of University of Balochistan, Pakistan Space and Upper Atmosphere Research Commission (SUPARCO) and Federal Public Service Commission. He is, also, a referee of *Astrophysics and Space Science (Springer)* [Thomson-Reuters Impact Factor, IF (2015) = 1.678], *Clinical Biomechanics (Elsavier)* [IF (2015) = 1.636], *Acta Paediatrica* [Thomson-Reuters Impact Factor (2015) = 1.647], *Optics and Laser Technology (Elsavier)* [IF (2015) = 1.879], *Pakistan Journal of Scientific and Industrial Research*, *Journal of Chinese Institute of Engineers* and *Proceedings of the Pakistan Academy of Sciences*.

His research, teaching and administrative experiences in institutions of higher learning and R&D organizations span over 35 years. He had an opportunity to lead teams in 24 different capacities, with progressively-increasing responsibilities (motivation, administration, crisis management, conflict resolution, establishment of national projects/laboratories), through his soft skills (communication, presentation, networking, ability to portray vision, out-of-the-box solutions) and research in administrative and leadership styles (conflict-resolution mechanisms linked to left- and right-hemisphere brain functioning, innovative skills along with technical and managerial skills for job seekers, modeling of corruption). Some key positions at the parent institution include Dean, Faculty of Science;

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® Higher Education Commission, Govt. of Pakistan
§ National Testing Service Pakistan
# American Institute of Aeronautics and Astronautics
∃ International Brain Research Organization
ɔ The Abdus Salam International Center for Theoretical Physics, Trieste, Italy
⊃ The Early Talent Research Participation Program
¶ Transparency International Pakistan
* Anthromathematics Group
$ Department of Mathematics
⊂ National Growth and Developmental Standards for the Pakistani Children http://ngds-ku.org
∈ United States (of America)

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2013	The First-Generation Solution of Childhood-Obesity Problem http://www.ngds-ku.org/Presentations/Roadmap.pdf
2014	The Second-Generation Solution of Childhood-Obesity Problem http://www.ngds-ku.org/Presentations/Enhanced.pdf
2015	The Third-Generation Solution of Childhood-Obesity Problem http://www.ngds-ku.org/Papers/J38.pdf
2016	The Fourth-Generation Solution of Childhood-Obesity Problem http://www.ngds-ku.org/Presentations/Vector.pdf

Caretaker Dean, Faculty of Engineering; Chairman, Departments of Applied Physics; Biotechnology; Chemical Engineering; Computer Science (2015-to date); Health, Physical Education and Sports Sciences (02/2016-to date); Mathematics (2003-2006, 2012-2015); Project Director, the NGDS Pilot Project (1998-to date); Chairman, Boards of Faculty (Engineering, Science, 2015-to date); Chairman, Boards of Studies of Applied Physics; Biotechnology; Chemical Engineering; Computer Science (2015-to date); Heath, Physical Education and Sports Sciences (02/2016-to date); Mathematics (2003-2006, 2012-2015); Editor-in-Chief, Karachi University Journal of Science (2015-to date); Acting Convener, Testing Services Committee (2008-2010 during absences of Convener); Convener, the Early Talent Research Participation Program (2002-2010); Program in Industrial and Business Mathematics (2003-2006, 2012-2015); BASR Sub-Committee (Science, Engineering and Medicine) for Synopsis Review (2015-to date); Director, MRCC (2015-to date); Acting Director, CEMB (01/04/2016-to date) and Acting Vice Chancellor (02-07/04/2016). Responsibilities entrusted by other organizations include Convener, National Curriculum Revision Committee for Mathematics, Higher Education Commission (2004-2012, prepared BS, MS and PhD curricula); Subject Committee for Mathematics, National Testing Service Pakistan (2009-2012) and Sub-Committee (Academics), the Education Committee, Transparency International Pakistan (2011-2014). He has 185 papers (176 as solo/first/corresponding author) in biomathematics, astrodynamics, relativity, physical mathematics and algebra, some of them appeared in *Biological Cybernetics (Springer)* [IF (2015) = 1.611], *Journal of Biological Physics (Springer)* [IF (2015) = 1.394], *Chinese Journal of Physics* [IF (2015) = 0.464] and *Matrix and Tensor Quarterly (Tensor Society of Great Britain)*.

His contributions to mathematics include defining determinant of a general tensor, introducing cardiac coördinates to study heart function, developing astrodynamical coördinates to study bounded keplarian motion, formulating *Strong Noether's Theorem* to study particle symmetries, suggesting mechanisms to avoid infinities from the Lorentz and the Poincaré Tranformations, constructing a minkowski-type metric for curved spacetime, propo-sing approaches to generalize principle of equivalence and devising new control laws, the extended-cross-product steering, the dot-product steering and the ellipse-orientation steering for spacecrafts and satellites, making mathematical models of brain, heart, spinal column and growth of children. In addition, he wrote a critical review of Richard H. Battin's book, "An Introduction to the Mathematics and (the) Methods of Astrodynamics". Some of the notable concepts put forward by him are the fourth law of thermodynamics (physics/chemistry), the sixth paradigm of physics, cross lattice (generalization of reciprocal lattice — condensed-matter physics), smart-intelligent power (generalization of soft power, smart power and intelligent power — international relations), edge-based moiré (combination of moiré fringe topography and edge-based algorithm — computer vision), air-spacecraft of the third millennium (green-engineering principles — aeronautics and astronautics), mathematical definition of brain death (exploring group structure of covariant model of global electrocortical activity — mathematical neuroscience) as well as first- to fourth-generation solutions of childhood obesity (month-wise targets to achieve specific heights and masses to be accomplished on checkup date of each following month — anthromathematics). Aerospace, health-care and security technologies are impacted by his research. He supervised PhD dissertations and MPhil theses of students in mathematics, information technology and physics. He taught courses at the Aga Khan University, Hamdard University, IBA, IST (Institute of Space Technology) and SZABIST. In addition, he conducted professional trainings at ENGRO and SUPARCO.

He introduced 11 new branches of mathematics, namely, anthromathematics, astromathematics, anthrotopology, condensed-matter mathematics, anthroalgebra, anthrogeometry, anthrodynamics, anthroimaging, sport mathematics, astro-anthromathematics and astro-anthrodynamics. Anthromathematics has matured since then with MPhil courses offered and two conferences held on the subject — the first one on September 4 and 5, 2013 and the second one on September 4, 2014. He has given 73 colloquia, guest lectures, presentations and seminars at various institutions of higher learning, including the Abdus-Salam International Center for Theoretical Physics, Italy and Massachusetts Institute of Technology, United States. In addition, he has conducted 21 trainings and workshops as well as in-service and professional development courses and organized 17 exhibitions, grand seminars, seminar series and conferences (chairman of 3 conferences). He was invited speaker in 12 conferences, session chair in 11 conferences, panelist (panel discussion) in 3 conferences, keynote speaker in 4 conferences and chief guest in 5 conferences/grand seminars. He presided over 3 conferences/grand seminars. His biography is included in Marquis Who's Who in the World. On November 4, 2010, he shared his life-long achievements as Guest Scientist in the Pakistan Academy of Sciences Karachi Chapter Program.

Anthromathematics March 22, 2010	**Astromathematics** October 8, 2012	**Anthrotopology** December 27, 2012	**Condensed-Matter Math.** December 28, 2012	**Anthroalgebra** April 10, 2013
End of document	**Anthrogeometry** April 10, 2013	**Anthrodynamics** April 10, 2013	**Anthroimaging** September 5, 2013	**Sport Mathematics** May 17, 2014
Web address of this document: http://www.ngds-ku.org/goals/Univprofile.pdf			**Astro-Anthromath.** December 29, 2015	**Astro-Anthrodynamics** May 01, 2016

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