Pakistan Mathematical Society Newsletter

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Editorial

Mathematics is the foundation of scientific progress, technological innovation, and intellectual growth. A healthy mathematical culture is therefore essential for any nation that seeks academic and national development. Since its inception, the Pakistan Mathematical Society (PakMS) has remained committed to promoting genuine scholarship, academic integrity, and excellence in mathematics.

Throughout history, mathematical societies have served as serious academic institutions, not social platforms for personal projection. Regrettably, Pakistan has recently witnessed the rise of several so-called mathematical societies lacking clear academic vision or purpose. Such bodies risk fragmenting the community, misleading young scholars, and lowering standards.

The need of the hour is to strengthen credible institutions, support quality research, and safeguard the future of mathematics in Pakistan with clarity, responsibility, and collective commitment.

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Strengthening Mathematics in Pakistan

Mathematics remains the foundational pillar upon which scientific progress, technological innovation, and intellectual advancement stand. As custodians of this discipline, we bear the responsibility of nurturing a strong mathematical culture that supports genuine scholarship and steers academic activity in the right direction. The Pakistan Mathematical Society (PakMS), since its inception, has sought to uphold this mission with integrity, vision, and a commitment to excellence.

Mathematical societies throughout history have played a transformative role in shaping intellectual movements. From the Pythagorean Brotherhood to the Enlightenment-era academies, these bodies provided platforms for collaboration, critical discourse, and the dissemination of new ideas. Their legacy reminds us that societies are not social clubs; they are academic institutions meant to safeguard the standards and direction of mathematics.

In the modern world, this role has become even more vital. With rapid developments in science and technology, the need for structured professional bodies that encourage research, facilitate dialogue, and cultivate young talent is greater than ever. A strong mathematical society connects scholars, builds networks, and anchors the discipline on principles of rigor, integrity, and academic merit.

However, the contemporary landscape in Pakistan reveals a troubling trend. In recent years, we have witnessed the mushrooming of so-called mathematical societies, often formed without clear academic purpose or vision. Many exist merely as vehicles for personal projection, titles, or influence, rather than as institutions committed to advancing mathematics. Such superficial organizations fragment the community, mislead students, and dilute the standards of scholarship. This situation demands urgent attention. It is imperative that the mathematical community collectively evaluates and distinguishes genuine academic societies from those established for self-serving motives. The integrity of the discipline requires careful stewardship.

PakMS reaffirms its commitment to uphold the highest standards of mathematical culture in research, education, and ethical practice. We continue to support quality research through conferences, publications, and collaborative forums. Our outreach initiatives aim to nurture talent from schools to universities, ensuring that the next generation encounters mathematics with curiosity, excitement, and intellectual honesty. We also remain dedicated to promoting transparency, accountability, and a scholarly work ethic across all our activities.

A thriving mathematical culture cannot be built on convenience or opportunism; it must rest on sustained commitment, shared values, and collective responsibility. I urge our members, colleagues, and the wider academic community to work together toward strengthening the foundations of mathematics in Pakistan. Let us protect this discipline from dilution and guide it toward the future with clarity and purpose.

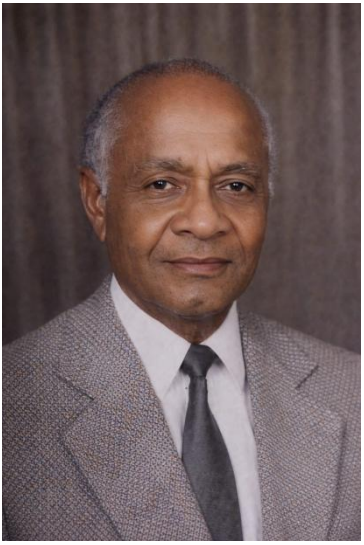
Mathematics is too important a field to be left to chance. With unity and integrity, we can ensure that it continues to evolve on the right lines—for the benefit of our students, our scholars, and our country.

Professor M. A. Rauf Qureshi

(1935- 2021)

Professor Qureshi was born in Agra, India, and later migrated to Pakistan. He completed his PhD in 1965 from the University of London under the supervision of the distinguished mathematician A. Fröhlich, focusing on Module Theory over Generalized Ore Rings, an area that intersects abstract algebra and ring theory. His groundbreaking paper, *Homomorphic Images of Objective Modules*, published in the Quarterly Journal of Mathematics (QJM), Vol. 22, 85-90, 1971, was well-regarded for its contribution to module theory. He proves that the property of being an objective module is preserved under homomorphic images. The work

examines the structural properties of these modules and their submodules, contributing to the broader understanding of ring and module theory.



Professor Qureshi joined the University of Karachi and had a distinguished career, where he served as a Professor and Chairman of the Department of Mathematics. Over his tenure, he was instrumental in building the department and fostering a research culture in mathematics, inspiring future generations of Pakistani mathematicians. Among his doctoral students were Dr. M. Zakaullah Khan (1995) and Dr. M. Ansari (1996), whose dissertations contributed to furthering research in algebra and its applications.

In addition to his research, Professor Qureshi actively participated in the Pakistani mathematical community and was a respected figure in academic circles. He was known for his rigorous approach to mathematics and dedication to his students. His work and mentorship played a foundational role in developing algebra as a field in Pakistan, influencing both local and

Professor Qureshi also founded the mathematical journal *Riazi*, a pioneering effort to promote mathematical research and scholarship within Pakistan. By establishing *Riazi*, he provided a crucial platform for local and regional researchers to publish their work, facilitating knowledge sharing and helping to elevate the standards of mathematical research in the country. This initiative reflects his dedication not only to mathematics as a discipline but also to supporting the broader academic community in Pakistan.

The Root of Job Problems for Mathematics Graduates

In recent years, a troubling trend has emerged across Pakistani universities: mathematics graduates face increasing difficulty securing meaningful academic and research positions. This is not merely a matter of limited opportunities or economic constraints; the deeper cause lies within the unchecked proliferation of low-quality PhD degrees and third-rate research.

A growing number of researchers—motivated by personal gain and institutional pressures—have adopted malpractices that undermine academic integrity. These include ghost authorship, the recycling of trivial ideas, and the production of repetitive papers on limited or narrow topics that contribute little to the advancement of mathematical knowledge. This substandard research, often published in obscure or predatory journals, serves primarily to inflate the credentials of supervisors and their protégés rather than to advance the field or train competent scholars.

Another alarming trend is the surge of multiple authorships within a few narrow areas such as fluid mathematics, cryptography, and fuzzification. The same groups of individuals repeatedly publish together on closely related topics, producing an enormous number of papers that add little variety to the national research landscape. This concentration not only stifles diversity in mathematical inquiry but also creates an ironic side effect: the co-authors of these papers eventually become competitors for the same academic positions in universities, all claiming equal credit for work that is neither original nor substantively distinct. This practice further distorts hiring processes and deepens the crisis of merit in the discipline.

The consequence is a devaluation of genuine academic merit. Graduates who are sincerely committed to mathematics find themselves sidelined by a system that rewards quantity over quality. University departments, increasingly controlled by self-serving cliques, resist appointing independent minds who might expose or challenge the prevailing culture of mediocrity. Instead, appointments often favour those willing to submit to the demands of these informal academic mafias.

This phenomenon has led to an overproduction of PhDs who are ill-equipped for teaching or research, flooding an already limited job market and displacing deserving candidates. The long-term implications are dire: a generation of poorly trained mathematicians, disillusioned youth, and institutions hollowed out by intellectual corruption.

Addressing this crisis requires a collective resolve to uphold merit, encourage ethical supervision, and restore the value of meaningful mathematical research. Without such reform, the job prospects for mathematics graduates—and the credibility of the discipline itself—will continue to erode.

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Unravelling the Tenure Track System and its Implications on Research

Emeritus Professor Qaiser Mushtaq

In the dynamic realm of academia, the Pakistani Mathematical Society finds itself at the crossroads of innovation and tradition. One of the significant shifts in recent times has been the introduction of the Tenure Track System (TTS), a structure designed to enhance the quality of research output and foster academic excellence. However, the implementation of this system has sparked discussions and debates within the mathematical community in Pakistan, particularly concerning its impact on the production of research papers by PhD students, the practice of encouraging multiple authorship of research papers, the link between impact factor and research paper quality, and the controversial rating of researchers based on cumulative impact factors.

The Tenure Track System, introduced to align academic careers with research productivity, has led to increased expectations for faculty members, particularly those pursuing PhD degrees. The pressure to publish high-quality research papers during the doctoral journey has become more pronounced. While the intention is to nurture a culture of continuous research engagement, concerns have arisen regarding the potential negative

consequences on the intrinsic motivation of students and the quality-versus-quantity dilemma.

In the pursuit of academic success, there has been a subtle encouragement of multiple authorship, often referred to as the "marriage of convenience," where researchers collaborate for mutual benefit. While collaboration is fundamental to scientific progress, the potential for undermining individual contributions and adherence to ethical standards is a concern. The Higher Education Commission must address the blurred lines between genuine collaboration and strategic partnerships that compromise the integrity of research output.

A contentious issue in the mathematical community is the perceived correlation between impact factor and research paper quality. The impact factor, a metric used to measure the significance of a journal, is not necessarily reflective of the quality or depth of individual research papers. The focus on impact factor may inadvertently encourage researchers to prioritize publishing in high-impact journals over the dissemination of meaningful and impactful research within the academic community.

The practice of rating researchers based on cumulative impact factors has become a subject of scrutiny. Cumulative impact factors may not accurately represent the diverse contributions and expertise of researchers.

Overemphasis on this metric can lead to a skewed assessment, neglecting the importance of individual achievements, innovation, and contributions to the mathematical community.

As the Higher Education Commission navigates the evolving landscape of academia, it is imperative to critically examine the implications of the Tenure Track System on research production, the dynamics of multiple authorship, the nuanced relationship between impact factor and research paper quality, and the potential pitfalls of rating researchers based solely on cumulative impact factors. Striking a balance between fostering a vibrant research culture and maintaining ethical standards is crucial for sustaining a thriving mathematical community in Pakistan. Through open dialogue and thoughtful consideration, the Higher Education Commission and the Pakistan Mathematical Society can chart a course that promotes excellence, integrity, and genuine contributions to the field of mathematics.

Professor Rauf-i-Azam

Professor Rauf-i-Azam is a distinguished academic leader with over two decades of multidisciplinary teaching and research experience. He earned his Ph.D. in Information Systems from the Nara Institute of Science & Technology in Japan.

Throughout his career, Dr. Rauf-i-Azam has held several prominent positions, including Director at the University Institute of Management Sciences, Pro-Rector at the University of Lahore, and Vice Chancellor at the University of Education, Lahore. He has also provided consultancy and training services to various organizations, playing a key role in numerous socio-economic development projects. He served as the Vice Chancellor of the Punjab University of Technology Rasul, Pakistan. He is now appointed as a Vice Chancellor of the Government College University Fasalabad.

Erosion of Integrity in Doctoral Research

Academic integrity in doctoral research rests on originality and individual authorship. However, in Pakistan's scientific academic environment, systemic weaknesses in supervision and institutional oversight have led to increasing instances of unethical collaboration and compromised research standards.

A doctoral thesis is meant to present original, thematically unified research addressing a clearly defined question. Its structure—comprising introduction, literature review, methodology, results, and conclusions—should reflect a

coherent intellectual effort. Ideally, all chapters contribute to a central theme, strengthening the overall argument. In practice, however, many theses are now constructed by compiling unrelated published papers, undermining thematic unity and scholarly depth.

A major contributing factor is the role of academic supervisors. Instead of fostering genuine inquiry, many supervisors pressure MPhil and PhD students to produce multiple publications prior to thesis submission. This excessive focus on publication metrics distorts the purpose of research and encourages expedient, and often unethical, practices.

The proliferation of multi-authored papers—frequently involving foreign collaborators and overlapping content—raises serious concerns. It suggests either that theses are no longer individual efforts or that authorship in publications is being misrepresented. In both cases, the integrity of research and the authenticity of academic contributions are compromised.

Universities, entrusted with maintaining academic standards, have largely failed to regulate these practices. Their inability or unwillingness to monitor supervision and enforce ethical norms has allowed such misconduct to flourish. This institutional neglect makes them complicit in eroding academic credibility.

The issue is not merely ethical but also legal. When thesis material is republished in multi-authored papers, while the thesis claims sole authorship, questions of intellectual property and copyright infringement arise. Misrepresentation of authorship violates both academic norms and legal standards, exposing institutions to potential consequences.

Addressing this problem requires systemic reform. Supervisors must prioritize ethical mentorship and emphasize original contributions over publication counts. Universities need to implement robust monitoring mechanisms, enforce clear ethical guidelines, and investigate misconduct rigorously. Furthermore, legal frameworks must be established to address authorship disputes and intellectual property violations, ideally in alignment with international standards.

In conclusion, the prevalence of unethical collaborations in postgraduate theses highlights a deep-rooted crisis in academic culture. Restoring integrity demands coordinated action by supervisors, institutions, and legal authorities. Without such intervention, the credibility of academic degrees and the very foundation of scholarly work will remain at risk.

Care in Using the Term ‘Mathematician’

In Pakistan, it is common to refer to MPhil or PhD holders and early-career lecturers as "mathematicians," even when their contributions to the field are minimal or just beginning. This practice should be reconsidered, as it inflates titles and undermines the distinction earned by those who have made significant, recognised contributions to mathematics. Overusing such terms dilutes their meaning, diminishes the value of real accomplishments, and creates unrealistic expectations. Some commentators abroad have also questioned, and at times even ridiculed, the use of this term in certain Asian countries, highlighting the need for greater care and precision. The title ‘mathematician’ should be reserved for individuals with a proven track record of impactful research or contributions to the field, ensuring academic integrity and respect.

A *mathematician* is someone who makes significant contributions that advance our understanding of mathematical principles, often publishing in reputable journals and solving complex problems.

Doctoral Supervision Standards: A Comparative Reflection on PhD Production Practices

The contrast between the number of PhD students supervised by world-renowned mathematicians and the significantly higher output of some Pakistani academics reveals a troubling imbalance in academic practices. In the careers of eminent scholars such as Prof. Abdus Salam, Roger Penrose, Michael Atiyah, Graham Higman, and Gian-Carlo Rota, the supervision of each doctoral candidate reflected a long-term intellectual engagement, rigorous scholarship, and meaningful mentorship. Their modest supervision rates underscore a sustained commitment to quality, originality, and the cultivation of independent researchers.

By comparison, the disproportionately high number of PhDs produced by some academics in Pakistan over comparatively short periods raises critical concerns regarding the integrity of the doctoral process. These trends point toward a system where quantity is increasingly privileged over quality, often at the expense of academic depth and originality. Rapid turnover in doctoral degrees may indicate derivative research, weak oversight, or even systemic malpractice, such as ghost authorship and insufficient mentorship.

The institutional emphasis on numerical outputs — including the total number of PhD graduates — to satisfy regulatory, funding, or ranking requirements has led to an erosion of academic standards. When research becomes a target-driven exercise rather than a pursuit of knowledge, the consequences are damaging: compromised

intellectual rigor, loss of international credibility, and the proliferation of underprepared scholars.

To counteract these trends and realign doctoral education with global best practices, several measures are necessary:

1. **Institutional Reforms**: Introduce rigorous, transparent criteria for research proposals, periodic evaluations, and thesis defenses to ensure that only well-vetted work progresses.
2. **Mentorship as a Scholarly Commitment**: Emphasize the supervisor's role as a mentor, not merely a procedural overseer. Effective supervision requires time, scholarly engagement, and academic integrity.
3. **Independent Evaluation**: Engage external examiners from internationally recognized institutions to ensure impartiality and uphold global standards in thesis assessment.
4. **Ethical Safeguards**: Implement policies to curb exploitative practices, such as undue co-authorship claims by supervisors, and promote a culture of academic honesty.

Academic institutions should move away from celebrating numerical milestones in doctoral production. Instead, they should prioritize scholarly impact, high-quality publications, and meaningful international collaboration. Upholding academic standards is essential not only for the credibility of higher education in Pakistan

but also for the development of a robust and ethical research culture.

Table 1: Comparative PhD Supervision Statistics of Eminent Mathematicians

Mathematician	PhD Students	Duration (Years)	Average per Year
Prof. Abdus Salam	24	31	0.77
Prof. Roger Penrose	38	41	0.93
Prof.Michael Atiyah	27	26	1.04
Prof. Graham Higman	52	28	1.86
Prof. Gian-Carlo Rota	49	25	1.96

These figures reflect a benchmark of intellectual commitment and academic excellence. It is imperative that current practices in doctoral supervision are reassessed in light of such standards to ensure the sustainability and integrity of higher education in Pakistan.

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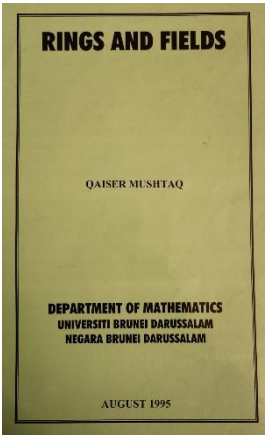
A Book Review of *Rings and Fields*

Dr Saadia Mehwish

Rings and Fields by Qaiser Mushtaq is a concise and well-structured introduction to fundamental topics in abstract algebra. Originally developed as lecture notes at Universiti Brunei Darussalam and later reproduced by the National Book Foundation, Pakistan, the text covers the essential elements of ring theory, polynomial rings, and factorisation domains in a clear and organi sed manner.



The author's pedagogical approach emphasises conceptual coherence rather than abstraction for its own sake. Definitions, key theorems, and standard techniques are presented succinctly, allowing the book to function effectively as a companion to classroom teaching or as supplementary material alongside more comprehensive algebra texts.

While intentionally brief, the book provides reliable guidance for students beginning their study of algebra and offers instructors a compact and disciplined framework for introducing the subject. Its clarity and focus make it a

useful resource in undergraduate mathematics programmes.

Professor Syed Muhammed Husnine

The Pakistani mathematical community notes with deep sorrow the passing of Syed Muhammed Husnine, a mathematician of distinction who served the University of the Punjab for much of his academic career. He passed away today in Lahore.

Professor Husnine received his PhD in 1976 from Ruprecht-Karls-Universität Heidelberg, one of Europe's leading centres of mathematical research. His doctoral work, supervised by the eminent group theorist Zvonimir Janko, was entitled:

"A Characterisation of $F_4(2)$ *by the Structure of the Centralizer of a 2-central Involution."*

The thesis placed him firmly within the international school of finite group theory, a field that was then

witnessing major developments, particularly in the study and classification of finite simple groups. His association with Professor Janko connected Pakistani mathematics to a highly influential European algebraic tradition.

Upon returning to Pakistan, Professor Husnine joined the University of the Punjab, where he devoted himself to teaching, research, and postgraduate supervision. According to the Mathematics Genealogy Project, he supervised six PhD students, whose doctoral degrees were completed between 2004 and 2022 at the University of the Punjab and the National University of Computer and Emerging Sciences. Through these students and their own supervisees, his academic lineage now includes fourteen doctoral descendants.

At a time when sustained research supervision in pure mathematics was rare in Pakistan, Professor Husnine's commitment to guiding doctoral students represented a significant contribution to the development of algebra and group theory in the country. He extended the research on the action of the modular group on real quadratic irrationals by using the method of Qaiser Mushtaq. His influence is thus preserved not only through his own scholarly work but also through the generations of mathematicians trained under his supervision.

He will be remembered as a serious and principled academic, belonging to an earlier generation of Pakistani mathematicians who received rigorous training abroad and sought to uphold international standards of scholarship at home.

On "Applications of Mathematics" in Pakistan's Research Culture

Emeritus Professor Qaiser Mushtaq

A troubling trend has taken root in the research culture of mathematics departments across Pakistan: a fundamental misunderstanding of what constitutes an "application of mathematics." This misconception is particularly widespread among young researchers, who often assume that a mathematical idea or theorem has value only when it is linked to physics, engineering, computer science, or some concrete real-world modelling problem.

This view is both historically and intellectually incorrect. Some of the deepest advances in mathematics arise from *internal* applications—one branch illuminating another, one lemma enabling the proof of a larger theorem, or one structural insight transforming an entire field. The mathematical sciences progress primarily through such internal interactions. To disregard these as "non-

applications" reflects a misunderstanding of the discipline itself.

A related problem is the belief that a research paper becomes publishable only when some "application component" is forcibly inserted. As a result, students often inject fashionable terminology unrelated to their actual work, or artificially link their results to distant subjects. This practice distorts students' mathematical thinking, and more importantly, encourages intellectual dishonesty.

These misconceptions reveal themselves most clearly in the abstracts and conclusions of many postgraduate research papers. Instead of presenting a precise summary of results, these sections frequently offer vague comments about the applications of the *field* rather than the specific contents of the paper. Such writing is neither informative nor scholarly; it signals conceptual immaturity and an inability to articulate one's own contribution.

Unfortunately, weak or superficial refereeing—especially in third-rate journals operating on author-payment models—reinforces these tendencies. Even when such journals are associated with reputable international publishers, the quality of review is often poor or entirely absent. Papers containing conceptual weaknesses, irrelevant applications, and misleading summaries are

routinely accepted, strengthening the misconceptions of young authors.

At this point, the role of the academic supervisor becomes critically important. When the supervisor is also a co-author and the work originates from the student's thesis, the responsibility for ensuring intellectual honesty and mathematical clarity is paramount. Allowing vague claims of applications, irrelevant material, or artificially embellished conclusions is a failure of mentorship.

The consequences of these practices are serious and far-reaching. They weaken mathematical maturity, compromise the integrity of research training, and further widen the gap between Pakistani scholarship and international standards. Young researchers are left with papers that do not represent genuine contributions to mathematics.

Most importantly, such papers will not be of any academic value for the future pursuits of young researchers. They will give no dividend in the international mathematical community.

A stronger research culture requires clarity of thought, honesty of purpose, and a correct understanding of how mathematics develops. Recognizing the true nature of mathematical applications is an essential first step.