Annual Report

SPIE. STUDENT CHAPTER
QUAID-I-AZAM UNIVERSITY

Quaid-i-Azam University
Islamabad, Pakistan

2017-2018
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Introduction of Chapter:

SPIE – QAU chapter was formed in April 2012 to organize and strengthen collaboration between researchers in the field of optics and other related disciplines. It has successfully continued sharing knowledge, experiences and creating environment for sustainable development in targeted fields.

Being associated to the number -1 ranked university in Pakistan, the potential to enhance international collaboration and creating opportunities for effective learning are immense. Chapter successfully organized multiple activities in which participants from within the university and outside university were given a platform where they expressed themselves and learnt from one other.

Chapter Team:

The SPIE-QAU chapter team has continuous support from Chapter Advisor and Faculty Members. The team is committed to spread awareness about Optics and Photonics in general and specifically about SPIE. The team comprises of three groups; Chapter Officers, General Student Members and Regular Members.

Chapter Advisor:

Dr. Qaisar Abbas Naqvi
Professor,
Head of EM Research Group,
Department of Electronics,
Quaid-i-Azam University,
Islamabad.
**Founding Office Bearers:**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>SPIE Designation</th>
<th>Name</th>
<th>Status</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>President</td>
<td>Khawaja Qasim Maqbool</td>
<td>Ph.D. Scholar</td>
</tr>
<tr>
<td>2</td>
<td>Vice-President</td>
<td>Mr. Faheem Ashraf</td>
<td>Ph.D. Scholar</td>
</tr>
<tr>
<td>3</td>
<td>Secretary</td>
<td>Mr. Tayyab Hussain Malik</td>
<td>Ph.D. Scholar</td>
</tr>
<tr>
<td>4</td>
<td>Treasurer</td>
<td>Mr. Muhammad Ramzan</td>
<td>M.Phil Scholar</td>
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**Office Bearers 2017-18:**

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<tr>
<td>1</td>
<td>President</td>
<td>Ms. Kiran Mujeeb</td>
<td>Ph.D. Scholar</td>
</tr>
<tr>
<td>2</td>
<td>Vice-President</td>
<td>Mr. Adil Qayyum</td>
<td>Ph.D. Scholar</td>
</tr>
<tr>
<td>3</td>
<td>Secretary</td>
<td>Ms. Sundus Naseer</td>
<td>Ph.D. Scholar</td>
</tr>
<tr>
<td>4</td>
<td>Treasurer</td>
<td>Mr. Tehreem Qasim</td>
<td>Ph.D. Scholar</td>
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General Student Members:

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<tr>
<td>1</td>
<td>Tayyab Malik</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>2</td>
<td>Kiran Mujeeb</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>3</td>
<td>Sundus Naseer</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>4</td>
<td>Tehreem Fatima</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>5</td>
<td>Tehreem Qasim</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>6</td>
<td>Adil Qayyum</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>7</td>
<td>Abid Ali</td>
<td>Ph.D Scholar</td>
</tr>
<tr>
<td>8</td>
<td>Hassan Ullah</td>
<td>Ph.D Scholar</td>
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<tr>
<td>9</td>
<td>Afsah Saleem</td>
<td>Ph.D Scholar</td>
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<tr>
<td>11</td>
<td>Khushboo Munir</td>
<td>MPhil Scholar</td>
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<tr>
<td>12</td>
<td>Kiran Amjad</td>
<td>M.Sc.</td>
</tr>
<tr>
<td>13</td>
<td>Sundus Baig</td>
<td>M.Sc.</td>
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<tr>
<td>14</td>
<td>Kiran Ilyas</td>
<td>M.Sc.</td>
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<tr>
<td>15</td>
<td>Rida Khawar</td>
<td>M.Sc.</td>
</tr>
<tr>
<td>16</td>
<td>Ghouri Saeed</td>
<td>M.Sc.</td>
</tr>
<tr>
<td>17</td>
<td>Hadi Abbas</td>
<td>BS</td>
</tr>
<tr>
<td>18</td>
<td>Andeel Abid</td>
<td>BS</td>
</tr>
<tr>
<td>19</td>
<td>Shoukat Ali Chandio</td>
<td>BS</td>
</tr>
<tr>
<td>20</td>
<td>Rizwan Majeed</td>
<td>BS</td>
</tr>
<tr>
<td>21</td>
<td>Nawal Naeem</td>
<td>BS</td>
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Regular Members:

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<tbody>
<tr>
<td>1</td>
<td>Dr. Qaisar Abbas Naqvi</td>
<td>Professor</td>
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</table>
**Initiatives & Planning:**

The elected committee and general body mutually agree to take the following initiatives on regular basis to ensure the effective role of chapter to meet with SPIE objectives in campus and in the country:

- Increase Students Involvement
- Organize Outreach Program in High Schools
- To continue the Annual Poster Competition on regular basis
- To start a Student Conference on regular Basis
- SPIE Introductory Sessions
- Social Media
- Faculty Visits
- Awareness about various SPIE Programs

With above objectives in mind, the SPIE – QAU team is working hard to achieve the goals. The Student membership is increasing and outreach program has been planned. SPIE – QAU team and students are actively working to spread words about SPIE in Pakistan through facebook.
Activities for 2017 – 2018:

Advanced Computational Electromagnetics Workshop- SPIE- QAU Chapter 2018

The SPIE – QAU Chapter organized a two days MATLAB Workshop from May 7th to May 8th 2018. The speaker of the workshop was Dr. Muhammad Zubair. Dr. Muhammad Zubair is currently associated with the Department of Electrical Engineering at Information Technology University, Lahore as an Assistant Professor. Before joining ITU, he was a Postdoctoral Research Fellow at SUTD-MIT International Design Centre and Division of Engineering Product Development (EPD) of Singapore University of Technology and Design (SUTD). He received his PhD in Computational Electromagnetics (CEM) at Polytechnic University of Turin, Italy. His PhD research was carried out at Antenna and EMC Lab (LACE) of Istituto Superiore Mario Boella (ISMB) in Turin-Italy where he worked on computational EM projects funded by Army Research Lab (ARL) in collaboration with Boston University, USA. During his postdoc, he has been working on various research projects related to Fractional Methods in Electromagnetics funded by US Air Force Office of Scientific Research (AFOSR)/ Asian Office of Aerospace Research and Development (AOARD), Singapore Temasek Laboratories (TL) and SUTD Undergrad Research Opportunities Program (UROP). He is the principal author of a book on Electromagnetism in Fractional Spaces published by Springer Nature, NY. He has contributed about forty scientific works in journals and conferences of international repute. He is a member of the IEEE, IEEE-Antenna and Propagation Society (AP-S) and American Physical Society (APS).

Students were invited to attend and present their research work in this workshop. Students of various universities participated in this activity. More than 90+ students attended this workshop.
You are cordially invited to attend a workshop on

**Advanced Computational Electromagnetics:**
from conventional fast solvers to the novel fractional formulations and their applications

7, 8 May, 2018

**VENUE**
Video Conference Room,
Department of Computer Science,
Quaid-i-Azam University, Islamabad

**ORGANIZED BY**
SPIE Student Chapter,
QAU, Islamabad

**IN COLLABORATION WITH**
- Department of Electronics, QAU, Islamabad
- Harmony Technologies (Private) Limited

*Schedule of the Event is attached*
Advanced Computational Electromagnetics: from conventional fast solvers to the novel fractional formulations and their applications

7, 8 May, 2018

INTRODUCTION

Computational Electromagnetics (CEM) replaces pencil-and-paper analyses with the electromagnetic simulation tools which can be used as a virtual laboratory where proposed design ideas can be tested, and virtual prototyping can be performed. It is quite well known that the CEM is a rather mature field. There are several well-established algorithms for solving EM simulation problems. At present, there are many powerful commercially available electromagnetic simulation tools that are based on single or hybrid forms of available algorithms. However, the generalized commercial EM tools are always limited in their applications by their computational efficiency and memory requirements for some special EM problems where an adhoc EM simulation algorithm will still be more useful.

The course is open to all academics, scientists, and research scholars who are working in the area of advanced Engineering Electromagnetics. It will be also beneficial to research scholars and postgraduate students who are in the beginning of their research and who intend to do their research in computational Electromagnetics.

PART 1
- Introduction to Computational EM
- Fast solution of integral equations in EM
- Fast and efficient EM solvers beyond commercial tools
- Application 1: Novel finite element method for solving problems with interior resonances
- Application 2: Development of adaptive fast EM solver for open acoustic resonators

PART 2
- Introduction to Intrinsic and Functional EM
- Numerical methods in Functional Dimension (FD) spaces
- Electromagnetic properties of all spaces
- Application 1: Modeling wave-tissue optical absorption at model surfaces
- Application 2: Modeling charge transport in spatially distributed organic materials
- Application 3: Modeling fields emanating at rough surfaces
- Application 4: Electromagnetic properties of heterogeneous dielectric materials
- Roadmap on fractional modeling in EM

VENUE
Video Conference Room, Department of Computer Science, Quaid-i-Azam University, Islamabad

REGISTER YOURSELF MUST BEFORE
May 06, 2018

FOR MORE INFORMATION & QUERIES
SPIE - QAU Chapter Office
Room No. 46, Physics Building, QAU, Islamabad. Email: qau.spie@gmail.com
OR
Prof. Dr. Q.A. Naqvi, Deptt. of Electronics, QAU, Islamabad

Poster of the workshop
Volunteers from Harmony Technologies with QAU Students
Dr. Muhammad Zubair (during his Lecture)
Chief Guest Dr. Azhar Abbas Rizvi during his concluding remarks
Students presenting gift to Dr. Muhammad Zubair.
Participants of the workshop on “Computational Electromagnetics: from conventional fast solvers to the novel fractional formulations and their applications” with Speaker and Chief Guest
Financial Statement:

Details of Expenses

<table>
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<tr>
<th>S. No.</th>
<th>Description</th>
<th>Expense Head</th>
<th>Amount Spent (USD)</th>
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<tbody>
<tr>
<td>1</td>
<td>Advanced Computational Electromagnetics Workshop</td>
<td>Marketing &amp; Advertisement</td>
<td>$200</td>
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<tr>
<td>2</td>
<td>Advanced Computational Electromagnetics Workshop</td>
<td>Certificates &amp; Souvenirs</td>
<td>$300</td>
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<tr>
<td>3</td>
<td>Advanced Computational Electromagnetics Workshop</td>
<td>Food &amp; Beverages</td>
<td>$600</td>
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<tr>
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<td><strong>Total Expenditure</strong></td>
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<td><strong>$1,100</strong></td>
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Details of Income

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<th>S. No.</th>
<th>Description</th>
<th>Amount Spent (USD)</th>
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<tbody>
<tr>
<td>1</td>
<td>SPIE Chapter Activity Grant</td>
<td>$900</td>
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<tr>
<td>2</td>
<td>Volunteer Contribution from Harmony Technologies (Private)</td>
<td>$200</td>
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<tr>
<td></td>
<td><strong>Total Income</strong></td>
<td><strong>$1,100</strong></td>
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Future Plans:

1. Science Cafe
2. Seminar, Workshop and Lecture Series
3. Poster Competition
4. Student Conference
5. Visiting Lecturer
6. Industrial Visits
7. Outreach Program
8. Science Fairs
9. International Day of Light Celebrations

Conclusion:

SPIE Student Chapter at Department of Electronics, QAU has added to exposure of students and facilities available to collaborate between different disciplines. Rapid growth in terms of events and participation by the students has been recorded. The student activities under SPIE – QAU umbrella have provided many opportunities of networking for students and have provided with the updated information about various scholarship programs. As a result a large number of students have secured admissions in foreign universities in last couple of years.

Prepared By

Kiran Mujeeb
President
SPIE-QAU Chapter

Approved By:

Dr. Qaisar Abbas Naqvi
Faculty Advisor
SPIE - QAU Chapter