نَادي الفِيْزِيَاء

جامعة الملك فهد للبترول و المعادن

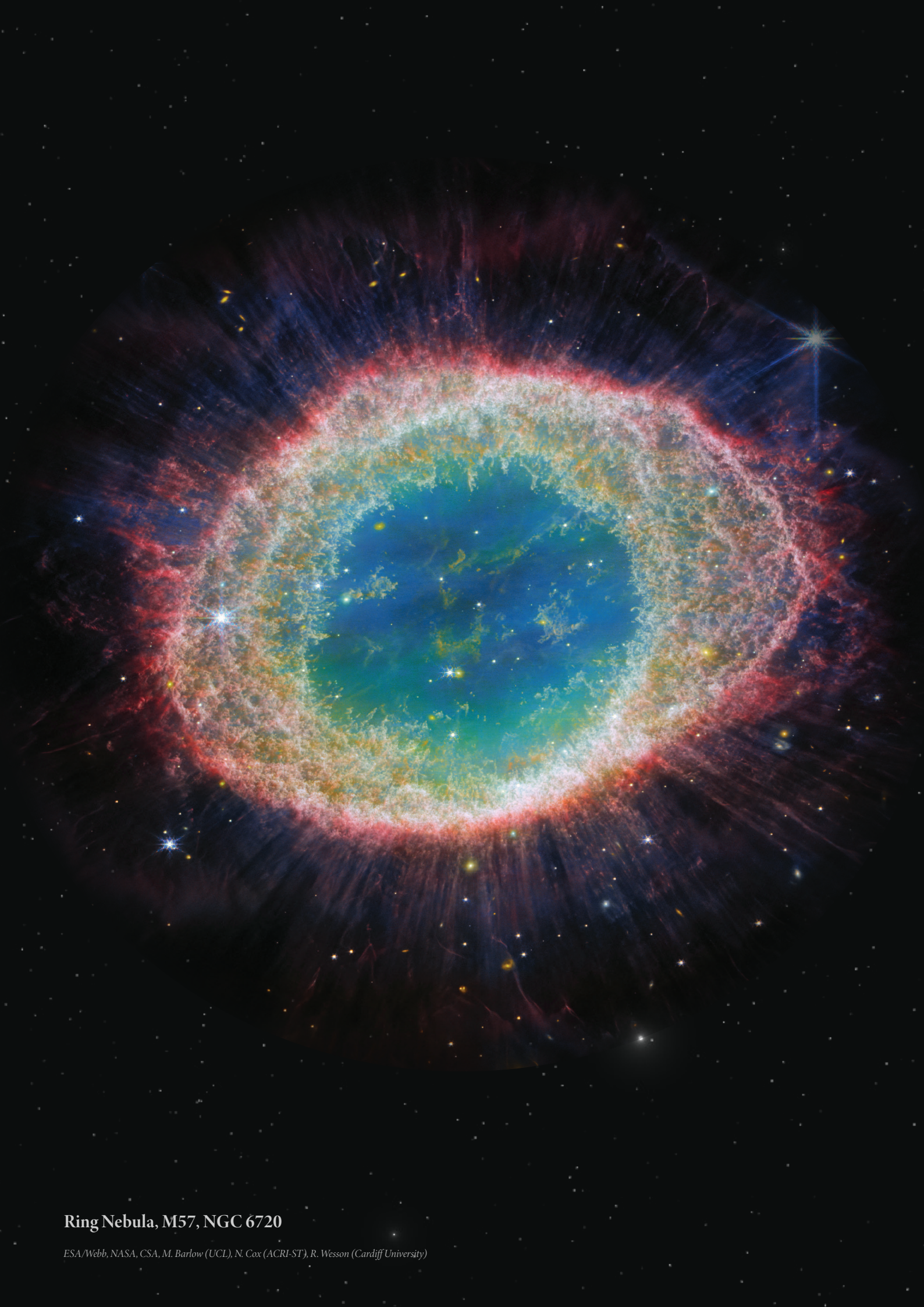
KFUPM Physics Club

Accomplishments

221-222

جامعة الملك فهد للبترول والمعادن

King Fahd University of Petroleum & Minerals



Ring Nebula, M57, NGC 6720

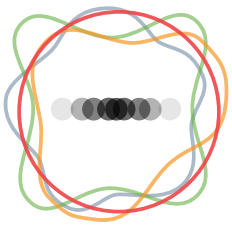
ESA/Webb, NASA, CSA, M. Barlow (UCL), N. Cox (ACRI-ST), R. Wesson (Cardiff University)

Dedication

To the Inquisitive Minds,

To all the curious minds and passionate explorers of the universe, this report is dedicated to you. Your unwavering enthusiasm for the mysteries of physics fuels our club's pursuit of knowledge. Thank you for being the driving force behind our scientific endeavors.

Ibraheem,
President, Physics Club



President's Statement

Ibraheem Al Yousef

Like a phoenix raising from the ashes, we rise again to kindle the flames of passion in our colleagues. Physics can be a hobby, and we at the physics club aim to provide the platform to engage with the true essence of physics passionately. Battling the hurdles of low enrollment (like physics, ironically), we needed to overperform... and we did! I have been gifted with the most talented of teams, a dream team whose driving force is their selflessness for sharing their passion with the world. I am proud to be a part of this club, and I am honored to have the acquaintance of my fellow physics-lovers!

Club's Tree

Club's President $|\Psi\rangle$

Ibraheem Al Yousef

As exact as the Copenhagen interpretation

Vice President $|V\rangle$

Muhammad Al Ali

Internal communication
Supervising VPs

PR $|P\rangle$

Umar Alhuwaymel

Head Hunting
Reserve Rooms
Contacts Guests

Finance $|F\rangle$

Hussain Al Saleh

Dhiafah
Invoices Management

Contents $|C\rangle$

Mohammed Al Saif

Content Preparation
Filtering/Choosing topics

Media $|M\rangle$

Ammar Alfaifi

Designing
Social Media
Out-of-the-box ideas

Contributors

Can participate in making decision
Can be a part in club's committees
Can present and create contents

Members

Can know our news
Can attend all meetings
Can participate in contests

A+ Party

The A+ Party is a highly anticipated annual event hosted by the Physics Department at KFUPM and expertly organized by the dedicated members of the Physics Club. This event is a celebration of academic excellence, specifically recognizing the outstanding achievements of male and female students who have excelled in the PHYS101 and PHYS102 courses during terms 211, 212, 213, and 221.

During the ceremony, the dean of academic development Dr. Alaswad introduced the new intercollegiate major of Physics + EE: EEPH. The program is directed towards students interested in fundamental knowledge of physics, together with problem-solving skills and an understanding of engineering. It is designed to address the needs of students seeking innovative careers in today's technological age.


كلمة رئيس الجامعة
د. محمد السقاف

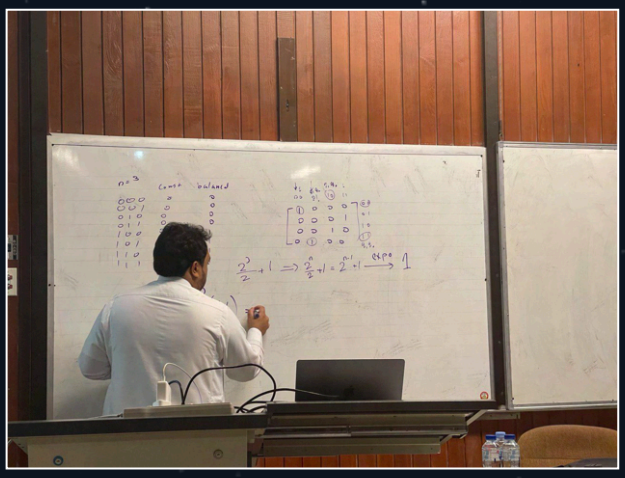
Carnival

Explaining different physics experiments, presenting the club's telescope, and conducting a drawing competition.

Quantum Week

Four days of different activities in Quantum Computing

- Meeting with three KFUPM Physics alums interested in quantum computing, Albaraa Shafi, an R&D engineer at NTIS, Ahmed Hajr, a Ph.D. student at UC Berkeley, and Mohammed Alghadeer, a Ph.D. student at Oxford.
- Qiskit workshop with Dr. Felemban.
- Quantum Computing CX/MX at KFUPM WITH Dr. Rao.
- Meeting with Aramco and Pasqal representatives about quantum computing in the industry.



Sun Eclipse

Inviting KFUPM students to the physics building to watch the sun eclipse using eclipse glasses provided by physics club. In addition, giving them the opportunity to see the eclipse from a telescope.

Star Gazing Trips

A trip for Physics club members to watch stargazing in a light pollution-free area.

Term 221 Trip:

Term 222 Trip:

Moon Monitoring

Ammar Alfaifi, a member of the physics club, taught the attendees how to set up the telescope and allowed them to watch the moon via the physics club's telescope.

Introductory Meeting

1. Present the events calendar for the year 2021
2. Introduce the members of the administration and committees and their roles.
3. Include a special segment titled "Physics and the Kingdom"

- The segment discusses the introduction of professors in the Physics department at our university and their specific specialties and noteworthy achievements.
- Additionally, the segment highlights some of the positions held by physicists, such as the Ministry of Commerce and Industry and the Ministry of Electricity (former Minister Hashem Yamani, a former professor in our department)
- The segment also introduces some of the most prominent institutions where physicists work, such as: the King Abdullah City for Atomic and Renewable Energy (KA-CARE), King Abdulaziz City for Science and Technology (KACST), Saudi Space Authority (SSC), the Saudi Nuclear and Radiological Regulatory Authority, departments of radiation and nuclear medicine in hospitals (e.g. King Fahad Hospital-KFSH), physics departments in all universities in the Kingdom, and scientific and developmental research centers.

Club's Activities

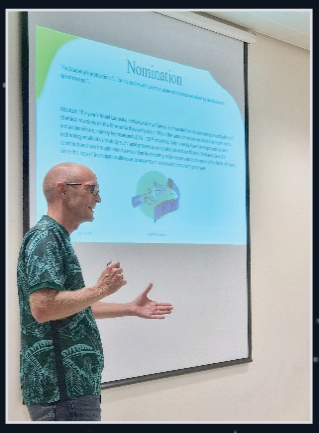
Introducing Activities

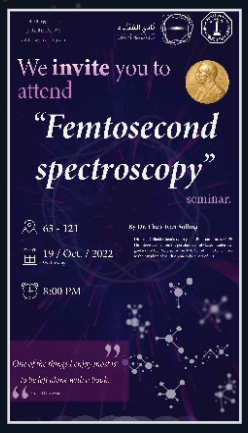
"Physics and the Kingdom" segment

Lectures

Femtosecond Spectroscopy

Introducing Dr. Zewail, how did he win the Nobel Prize, and his most famous discovery, Femtosecond Spectroscopy. Furthermore, explaining how Dr. Zewail discovered the femtoseconds and what did this research change in the science world.





Dr. Ivan Solling

Physics mind bender

Refraction and Total Inertial Refraction

Pouring a pencil in a glass of water and asking the audience to explain this phenomenon. Once one of them gets the answer or they could not get the answer, the presenter will illustrate how and why does this phenomenon happens.

Black Holes with Ringed Accretion Disks

Dr. AL Zahrani explained what Black Holes with Ringed Accretion Disks is and presented some research of his about this topic. In addition, he graphically illustrated some features of this type of black hole.

Physics mind bender

Physics mind bender center of mass(lecture activity):

Presenting a video that shows an object moving upwards on an inclined surface, while it should be moving downward due to gravity. Asking the audience to explain this phenomenon. Once one of them gets the answer or they could not get the answer, the presenter will illustrate how and why does this phenomenon

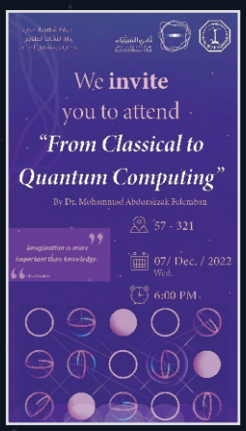
Kahoot!

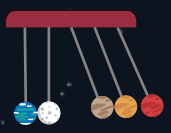
Presenting a Kahoot questions about what Dr. AL Zahrani has explained. In addition, showing the top three students who answered the questions and honoring them. Furthermore, explaining the answers of these questions to the audience.

From Classical to Quantum Computing

Discussed:

- Theoretical concepts in the beginning, such as: superposition, entanglement, Bloch sphere representation etc.
- Various types of hardware implementations (superconducting, ion trap etc.)
- Quantum software (gates, algorithms etc.)
- The applications of quantum computing in various different disciplines
- The need for a quantum computer and Moore's law
- quantum hype vs. reality





Meeting with Physicists

There were four distinguished Physics professors present at the session, three of whom are currently imparting their knowledge to eager students and one who has previously contributed to the academic world as a former professor. These esteemed educators are:

- **Dr. Abdulaziz Al-Haidari**
  - Founder of Saudi Center for theoretical Physics
  - Ex faculty member
  - Active researcher
- **Dr. Hocine Bahlouli**
  - Professor
  - Condensed matter
- **Dr. Michael Vogl**
  - Assistant professor
  - Condensed matter
- **Dr. Raditya Weda Bomantara**
  - Assistant professor
  - Condensed matter and quantum computing

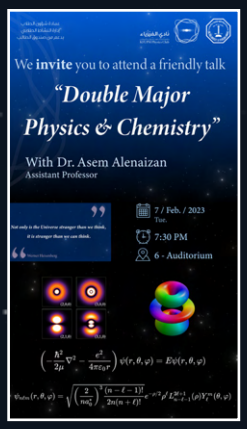
The interactive nature of the session allowed for a dynamic exchange of ideas and information, fostering a collaborative learning environment. The professors and students alike were enthusiastic and engaged throughout the session, demonstrating their passion for the subject and their dedication to advancing their knowledge of physics.

In general, the following topics were discussed:

- The status of physics in the Kingdom
- The story of each professor's relationship with physics and how they got started
- An overview of the teaching style of physics in Germany
- Why the professors chose KFUPM
- The current status and future direction of quantum computing.

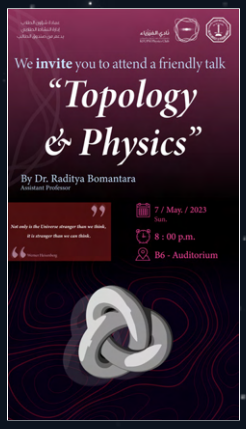
Double Major Physics and Chemistry

A discussion between Dr. Asem Alenaizan, an associate professor at KFUPM and Moayad Ekhwan, a member of the physics club, and the attendees about physics and chemistry.

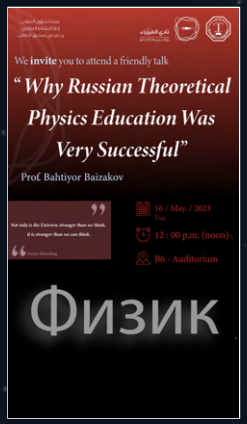


Topology & Physics

A lecture done by Dr. Raditya, an assistant professor at KFUPM, to show the overlapping between physics problems and topology.

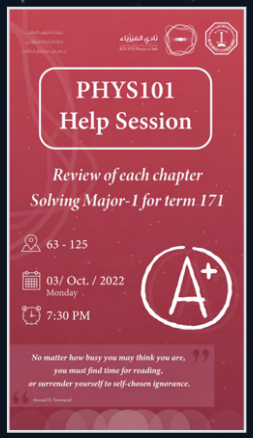


Russian Physics Education



Why Russian Theoritical Physics Education was Very Successful

Help Sessions



Helping physics 101/102 students by solving old exams questions and explaining how to solve them in detail.

Quantum Workshop

Two days workshop about quantum computing done by Umar Alhuawaymel, a member of the physics club.

Day 1:

- History of Computers
- Quantum Mechanics
  - Theory
  - Superposition
  - Harmonic Oscillators
- Computer Science
  - Qubit Representation
  - Classical Gates
  - Quantum Gates
- Hardware
  - Physical Realizations
  - Superconducting Qubits
  - History of Fabrication

Day 2:

- Superconducting Qubits
  - Harmonic oscillators as a paradigm
  - L.C. circuits & resonators
  - Superconductivity
  - Josephson Junction
  - Design & simulation of resonators
- Quantum Algorithms
  - Dutch-Jazsa's Algorithm (1992)
  - Shor's Algorithm (1994)
  - Grover's Algorithm (1996)

Umar Alhuawaymel

LaTeX Workshop:

A workshop done by a contributor to teach the students how to use LaTeX.

```
\begin{equation*}
        \frac{d}{dt}\left(\-
frac{\partial \mathcal{L}}{\par-
tial \dot{q}_i}\right) -
\frac{\partial \mathcal{L}}{\par-
tial q_i} = 0
\end{equation*}
```

$$\frac{d}{dt}\left(\frac{\partial \mathcal{L}}{\partial \dot{q}_i}\right) - \frac{\partial \mathcal{L}}{\partial q_i} = 0$$

Trips

KASCT Trip

Led by Professor Burhan SaifAddin, a group of students visited the King Abdulaziz City for Science and Technology (KACST). They explored KACST's cleanroom, nuclear institute, and CERN exhibition, gaining firsthand knowledge of the institution's advanced research and facilities.

FemtoLab Trip

Femtolab: Our visit to the Petroleum Engineering and Technology Center included a tour of the Femtosecond Laser Laboratory, one of three such labs in the Middle East, as well as the HPHT Flow Loop and the Isotope Laboratory.

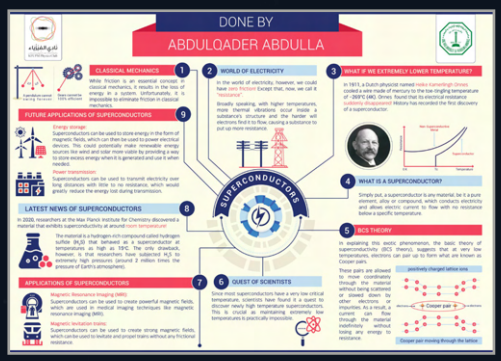
Treasure Hunt

A competition organized by the Physics club in which a student's groups will participate in a Kahoot quiz about physics, and the top four groups will be able to participate in the second phase of this competition. In the second phase, there are four locations, each of which has a contributor that will give the participants a puzzle to solve, once they solve it, they can go to the next location. At the end of the competition, the top three groups will win prizes.

The winning team

Physics Poster Competition

The Physics Poster Competition showcased the brilliance of young physicists across six branches, with over 20 captivating submissions. The top three winning posters explored the mysteries of black holes, the promise of superconductivity, and the wonders of optics, underscoring the rich diversity of physics research.



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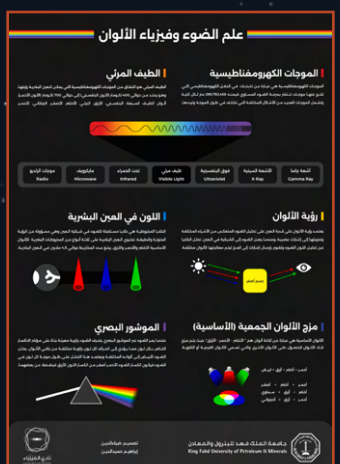


3

In Numbers

33 Events

 Physics A+ party

 Sun eclipse observation

 5 Celestial observations

 3 Help sessions (PHYS101/PHYS102)

 > 666 Events attendees

 20 Contributors

 > 110 Members

Contact us

People of The Club

إبراهيم اليوسف
PHYS

محمد العلي
PHYS

محمد آل السيف
PHYS

عمر الهويمل
PHYS

عمار الفيفي
PHYS & CS

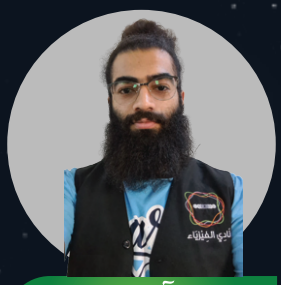
حسين الصالح
PHYS

صالح القزلان
PHYS

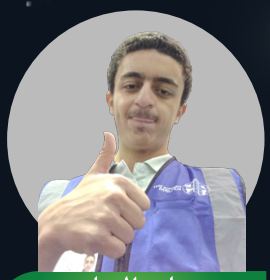
عبدالإله حكمي
PHYS

مؤيد إخوان
PHYS& CHEM

أحمد السلمي
PHYS& ME

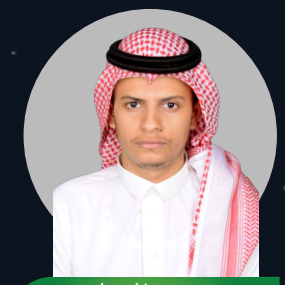


علي آل السويد
PHYS



زياد العلمي
COE

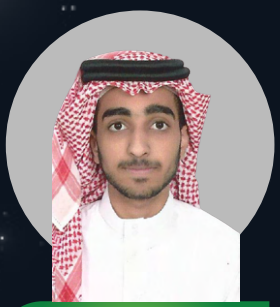
يزن زواوي
AE



محمد الحازمي
AE

ريان رضا
SWE& PHYS

محمد رشاد
SWE



عبدالله الجشي
PHYS&EE

مروان الخياط
SWE

فاضل العبيدي
CS

أحمد الزهير
SWE

Designed π:

Mohammed Rashad

@Mo_Rashad17