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**Institute of Physics of the Polish Academy of Sciences  
in Warsaw**

## DOCTORAL DIPLOMA

**Ghulam Hussain**

(names and surname)

born on **April 6, 1993** in **Peshawar, Pakistan**  
(date) (place)

on the basis of the presented doctoral dissertation entitled

**Investigating the electro-optical properties of 3D superlattices and 2D materials: a DFT study**

(title of the doctoral dissertation)

and having passed the required examinations, has been admitted to the degree of

## DOCTOR

in the field of **Natural Sciences** in the discipline of **Physical Sciences**

by the resolution of the Scientific Council of the Institute of Physics

of the Polish Academy of Sciences of **September 28, 2023**  
(date on which the degree was granted)

Reviewers:

**prof. dr hab. Andrzej Jezierski**

**dr hab. Karol Szałowski, prof. UŁ**

**dr hab. Maciej Winiarski**

(names and surnames)

Supervisor:

**dr hab. Carmine Autieri, prof. IF PAN**

**dr Giuseppe Cuono**

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(names of Supervisors and Auxiliary Supervisor, if applicable)

Seal

Dyrektor  
Instytutu Fizyki PAN

**Prof. dr hab. Roman Puźniak**

(Director of the Institute)

Nr **876/2023**

Warsaw, **September 29, 2023**  
(date of issue of the diploma)



Full qualification at Polish Qualifications Framework  
and European Qualifications Framework level eight