



## ANAS EL BALALI

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### EDUCATION

**Ph.D | High energy physics**

Physical aspects of black holes in Anti de-Sitter space-time

December. 2017 – 03 July 2021

Mohammed V University, Rabat, Morocco

**Master | Mathematical physics**

Faculty of Science of Rabat

October. 2015 – October 2017

Mohammed V University, Rabat, Morocco

**Licence | Modern physics**

Faculty of Science Semlalia Marrakech

October. 2010 – July 2015

Caddi Ayyad University, Marrakech, Morocco

### EXPERIENCES

**Teaching of general relativity | Master**

Faculty of Science of Rabat

Spring 2018

Rabat, Morocco

- Lecture planning and teaching
- Tutorial work
- End of module exam

**End of study project supervision | Master: Black hole physics**

Faculty of Science of Rabat

Spring 2019

Rabat, Morocco

- Project planning and supervision
- Introduction to research in black hole physics

**End of study project supervision | Master: Black hole thermodynamics**

Faculty of Science of Rabat

Spring 2020

Rabat, Morocco

- Project planning and supervision
- Introduction to research in thermodynamics of black holes

**End of study project supervision | Master: Black hole optical aspects**

Faculty of Science of Rabat

Spring 2021

Rabat, Morocco

- Project planning and supervision
- Introduction to research in black hole shadow and deflection angle

**Assistance of the relativistic quantum mechanics lectures | Master**

Faculty of Science of Rabat

Spring 2021

Rabat, Morocco

- Introduction to special relativity
- Tutorial work

**Chemistry and physics | High school**

Excel Academy

Spring 2022

Marrakech, Morocco

- Chemistry-physics lectures and tutorial work for the 11th grade

## PROJECTS AND RESEARCH

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### Research

- Dark energy effects on charged and rotating black holes** 2019  
Faculty of Science Kenitra, Morocco
- Authors: A. Belhaj, A. El Balali, W. El Hadri, H. El Moumni, M. B. Sedra
  - Journal: The European Physical Journal Plus vol. 134, No 9 2019, p. 422
- Deflection angle and shadow behaviors of quintessential black holes in arbitrary dimensions** 2020  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, M. Benali, A. El Balali, H. El Moumni, S. E. Ennadifi
  - Journal: Classical and Quantum Gravity, 37(21) 2020, 215004.
- Kerr-AdS black hole behaviors from dark energy** 2020  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, A. El Balali, W. El Hadri, M. A. Essebani, M. B. Sedra, A. Segui
  - Journal: International Journal of Modern Physics D, Vol. 29, No. 09 2020, 2050069.
- On phase transition behaviors of Kerr-Sen black hole** 2020  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, A. El Balali, W. El Hadri, H. El Moumni, M. A. Essebani, M. B. Sedra
  - Journal: International Journal of Geometric Methods in Modern Physics, Vol. 17, No. 11 2020, 2050169.
- On universal constants of AdS black holes from Hawking-Page phase transition** 2020  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, A. El Balali, W. El Hadri, E. Torrente-Lujan
  - Journal: Physics Letters B, 811 2020, 135871.
- Phase transition and shadow behaviors of quintessential black holes** 2021  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, A. El Balali, W. El Hadri, Y. Hassouni, E. Torrente-Lujan
  - Journal: International Journal of Modern Physics A, Vol. 36, Nos. 8 - 9 (2021) 2150057.
- Black hole shadows in M-theory scenarios** 2021  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, M. Benali, A. El Balali, W. El Hadri, H. El Moumni, E. Torrente-Lujan
  - Journal: International Journal of Modern Physics D, 30(04) 2021, 2150026.
- Shadows of Charged and Rotating Black Holes with a Cosmological Constant** 2021  
Faculty of Science of Rabat Rabat, Morocco
- Authors: A. Belhaj, M. Benali, A. El Balali, W. El Hadri, H. El Moumni
  - Journal: International Journal of Geometric Methods in Modern Physics, (2021), 2150188.
- Project**
- Deflection angle and shadow of slowly rotating black holes in galactic nuclei** 2022  
Faculty of Science of Rabat Rabat, Morocco
- Shadow and deflection angle of supergravity black holes** 2022-2023  
Faculty of Science of Rabat Rabat, Morocco
- Quantum Schwarzschild Black hole Optical Aspects** 2023  
Faculty of Science of Rabat Rabat, Morocco

### CONFERENCES

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- On Dark Energy Effects on charged Black holes Radiation Spectrum** April 2019  
National congress in fundamental physics and its applications Beni melal, Morocco

### HONORS AND AWARDS

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- Laureate of the Mohammed V University** 2016/2017  
Master laureate 2015/2017

### SKILLS

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- Languages:** Arabic (Native), French (C1), English (C1)  
**Programming:** Linux, Windows, Ms Office, C++, MATLAB, Mathematica