

# Özgen Tunç Türker

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“Non est ad astra mollis e terris via.”

## Education

### DOCTOR'S DEGREE

**PPGCosmo - Supervisor: Dr. Valerio Marra**

FEDERAL UNIVERSITY OF ESPÍRITO SANTO

Vitória, Espírito Santo, Brazil

Sept. 2022 - Present

### MASTER'S DEGREE

**NPAC - Nuclei, Particles, Astroparticles and Cosmology  
(2nd year of Master's)**

SORBONNE UNIVERSITY

Paris, France

• Grade: 13.06/20.00

Sept. 2020 - June 2021

**Paris Physics Master (1st year of Master's)**

SORBONNE UNIVERSITY

Paris, France

• Grade: 13.13/20.00

Sept. 2019 - June 2020

### BACHELOR'S DEGREE

**Physics (Erasmus Exchange)**

SORBONNE UNIVERSITY

Paris, France

• Grade: 14.10/20.00

Sept. 2017 - June 2018

**Electrical Engineering (Major) & Physics Engineering (Minor)**

ISTANBUL TECHNICAL UNIVERSITY

Istanbul, Turkey

• Grades: 3.42/4.00 & 3.19/4.00

• Thesis on Quantum Computing (☞)

Sept. 2014 - June 2019

## Skills

#### Numerical tools:

Mathematica, NumPy, Matlab

#### Coding:

PyQt5, HTML & CSS  
Django, C++, C#, MySQL

#### Hardware:

Arduino, Raspberry Pi

#### Languages:

Turkish (native), English (IELTS: 7)  
French (Delf B2)

## Experience

### Institute of Astrophysics and space sciences (IA)

VOLUNTEER RESEARCH - Supervisors: Dr. Alberto Rozas-Fernandez & Dr. Francesco Pace

Lisbon, Portugal

December 2021 - Present

- I am working on a kinetically coupled tachyonic dark energy model.
- I derived equations of motion, the Klein-Gordon equation and wrote the autonomous system of equations. I analysed the dynamics of the system (existence, stability and accelerated expansion conditions) on **Mathematica** and simulated the evolution of cosmological parameters.

### GALHECOS - The Strasbourg Astronomical Observatory

INTERNSHIP - Supervisors: Dr. Oliver Müller & Dr. Benoît Famaey

Strasbourg, France

March 2021 - June 2021

- I worked on the subject “Modified gravity under scrutiny (☞) – testing MOND (☞) with pairs of SDSS MaNGA galaxies” as my master's graduation project. I learned the challenges of LCDM and an alternative acceleration-based theory, Modified Newtonian Dynamics.
- I used **NumPy** in the project and created synthetic spiral galaxies with infinitesimally thin exponential disk approximation for different disk masses and disk scale lengths. I modelled their rotation curves and the external field effect of MOND produced by nearby galaxies. Then, I confronted the results from those models on an observed environmental effect in the SDSS MaNGA galaxy survey (Douglass & Demina, 2020).

### SYRTE - Observatory of Paris

INTERNSHIP - Supervisor: Dr. Pacôme Delva

Paris, France

July 2020 - August 2020

- I worked on the relative positioning (☞) of the satellites.
- I identified satellites with an onboard GNSS receiver, and Sentinel-3A was selected to study. I obtained the distance data of Sentinel to a GPS satellite from the RINEX file. Then, I compared these data with the ones I calculated by gathering position data of both Sentinel and GPS with respect to the earth. I analysed position data by using **NumPy** from 3 different file formats: RINEX, POE and sp3.
- I learned about orbit mechanics, the *georinex* package and the *ElementTree* library.

### Complex Media Optics Laboratory - Kastler-Brossel Laboratory

INTERNSHIP - Supervisor: Dr. Hilton B. de Aguiar

Paris, France

April 2020 - July 2020

- I worked on a project about speckle statistics (☞).
- I learned microscopy imaging, Structured and Blind Structured Illumination Microscopy. I focused on Blind Structured Illumination Microscopy and worked on speckles which are intrinsic *granular interference* of coherent light sources. These speckles obey Rayleigh statistics. I tailored these statistics to obtain arbitrary probability density functions (Bender et al., 2018) in order to use speckles in non-linear imaging.
- I manipulated the speckle intensities in **MATLAB** and retrieved phases using a non-linear optimization library (NLopt). Then, I applied these phases to the spatial light modulator.

## Eastern Anatolia Observatory - Atatürk University, Astrophysics Application and Research Centre

Erzurum, Turkey

INTERNSHIP - Supervisor: Engr. Emre Doğan

August 2018 - August 2018

- I completed a Wi-Fi controlled relay project for a telescope dome. I used a **Raspberry Pi 3** and designed a graphic user interface with **PyQt5**.

## Scholarships

2020-21 **International Mobility Grant of Science and Engineering Faculty of Sorbonne University**

Paris, France

2017-18 **Erasmus Grant**

Istanbul, Turkey

## Projects

### ITU Rover Team

MDRS, Hanksville, UT, USA

TEAM LEADER & FOUNDER - Supervisor: Dr. Serkan Türkeli

August 2016 - August 2017

- ITU Rover Team is a project team for the University Rover Challenge competition of Mars Society. We designed and built our own mars rover prototype, an unmanned ground vehicle with 1m x 1m x 0.6m dimensions and 40kg of weight with a 6kg robotic arm.
- The competition took place in the Mars Desert Research Station in Hanksville, Utah, U.S.A. We were the first team who joined the competition from Turkey. There were different tasks to complete, including an autonomous one. We took 13th place among 30 finalists.
- I was in the team leader position. With five sub-teams, we were 32 students working on the year-long project (🔗).

### ARIGE (ITU Robotics)

Turkey & Austria

MEMBER & LEADER - Supervisor: Dr. Nil Banu Tarım

January 2014 - April 2018

- ARIGE was a project-based student club. We participated in more than ten domestic (IZTECH Roboleague, International Metu Robotics Day, etc. ) and one international (RobotChallenge 2016) robotic competitions. We built many robots in different categories, like puck collect, robot combat, line follower, search and rescue, freestyle, etc.
- All our robots were custom made and I worked in every mechanism. I designed and manufactured the chassis for the robots, used various sensors, motors and microcontrollers for different tasks.

### Voting Web Page (🔗)

Istanbul, Turkey

PERSONAL PROJECT

February 2017

- Doodle like web application. Created for the purpose of selecting people representing the ITU Rover Team in U.S.A. I designed it with **Django**.

### Box Office Programming Project

Istanbul, Turkey

PERSONAL PROJECT

August 2014

- A program for theater ticket selling, shows empty and occupied places. The front end was written by **C#** and the back end by **MySQL**.

## Extracurricular Activity

### EDUCATIONAL

#### Science Talks - A Science Reading Club

Istanbul Technical University

ORGANISER

November 2015 - June 2016

- We organised weekly meetings and discussed different scientific topics (from economics to the science in classical antiquity). It helped me improve my communication and critical thinking skills. It widened my knowledge of science in general.

#### Technical Courses in Beginner Level - Arduino & Python (🔗) & NumPy

Istanbul Technical University

INSTRUCTOR

2015 - 2019

- These are on average 6 weeks long (2 hours/week) unofficial courses offered to the curious students of ITU in the ITU Robotics Club. In each course, it is tried to introduce basic concepts and applications.

### NON-EDUCATIONAL

#### Taçspor Sport Club & University Football Team

Istanbul, Turkey

FOOTBALL PLAYER - GOALKEEPER

2004 - 2019

- I had been amateur licensed player between 2004 & 2017 in Taçspor sport club and I've played in university team between 2016 & 2019.

## Hobbies

**Music** I have my own digital music collection, 160Gb, 21.812 items. I was streaming an internet radio station between 2014-2018.

**Beer** I have a beer bottle collection contains 123 different bottle, cans and glasses of different brands from all around the world.