

## Contact

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(LinkedIn)

## Top Skills

Mathematica  
LaTeX  
Experimentation

# Emrah Tiras

Particle & Neutrino physicist, working on ANNIE, NOvA and DUNE experiments at Fermilab & CMS experiment at CERN.

Batavia, Illinois, United States

## Summary

I am an Assoc. Prof. in the Physics Department at Erciyes University, and working on the neutrino experiments, ANNIE, NOvA, and DUNE at Fermi National Accelerator Laboratory (Fermilab) and EOS experiment at UC-Berkeley. I am also holding an affiliated scientist position at the University of Iowa and affiliated with the CMS experiment on the LHC at CERN.

From January 2017 to October 2020, I worked on the neutrino experiments, ANNIE, and NOvA at Fermilab as a postdoctoral research associate for Iowa State University. I worked as a Run Coordinator and Phase II Upgrade and installation Manager for ANNIE and did neutron simulation studies and physics analysis for NOvA.

I completed my M.Sc. degree in August 2012 and my Ph.D. in December 2016 at the University of Iowa on the CMS experiment on the LHC at CERN.

## Ongoing Research:

I have been doing neutron simulation studies and physics analysis for ANNIE and NOvA since January 2017. I am also working on detector R&D studies for the CMS experiment at CERN and other high-energy-particle detectors around the world. Our main focus is running an R&D program for particle detectors and calorimeters and investigating cheap, radiation-hard, and fast-timing scintillators.

My research interests are neutrino physics, particle physics, experimental nuclear physics, Monte Carlo simulations, detector R&D, calorimetric studies, data acquisition systems, and electronic instrumentation. My detector research efforts are aimed at developing novel particle detectors for neutrino experiments, collider

experiments, and other projects where precise particle detectors are required.

My primary physics research interest is neutron studies and understanding their production and detection in neutrino experiments. I am also interested in Charged Current Quasi-Elastic (CCQE) neutrino interactions and a better understanding of multi-nucleon physics processes such as 2p-2h.

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## Experience

Erciyes University

5 years 3 months

Associate Professor

July 2023 - Present (2 years 6 months)

Kayseri, Turkey

As of July 20, 2023, my application for the Associate Professorship was approved by the UAK (Turkish Interuniversity Board). I am now working as an Assoc. Prof. in the Physics Department at Erciyes University and I am also holding an affiliated scientist position in the Department of Physics and Astronomy at the University of Iowa.

Vice (Associate) Dean for Research

February 2023 - Present (2 years 11 months)

Kayseri, Turkey

Assistant Professor

February 2021 - July 2023 (2 years 6 months)

Kayseri, Turkey

As of February 11, 2021, I started a new faculty position in the Physics Department at Erciyes University. I am also holding an affiliated scientist position in the Department of Physics and Astronomy at the University of Iowa.

Lecturer, Ph.D.

October 2020 - February 2021 (5 months)

Kayseri, Turkey

Fermilab

15 years 4 months

Visiting Research Scientist

October 2020 - Present (5 years 3 months)

Batavia, Illinois, United States

- Working on neutrino experiments; ANNIE, and NOvA at Fermilab.
- Run Coordinator of ANNIE experiment.
- Physics analysis and neutron simulations for ANNIE & NOvA.
- Detector R&D for future neutrino experiments (LAPPDs: Large Area Picosecond Photo-Detectors, and WbLS: Water-based Liquid Scintillator).
- Collaborator for proposed THEIA experiment in the U.S.

**Postdoctoral Researcher**

January 2017 - October 2020 (3 years 10 months)

Batavia, IL, USA

Working on neutrino experiments, ANNIE and NOvA at Fermilab.

Run Coordinator of ANNIE experiment.

Phase II Upgrade and Installation Manager of ANNIE experiment.

Physics analysis and neutron simulations for ANNIE & NOvA.

Detector R&D for future neutrino experiments (LAPPDs: Large Area

Picosecond Photo-Detectors, and WbLS: Water-based Liquid Scintillator).

Collaborator for proposed THEIA experiment in the U.S.

**Graduate Student Researcher**

September 2010 - December 2016 (6 years 4 months)

Batavia, IL, USA

Researcher in Fermilab-T1041 Collaboration: CMS Forward Calorimetry R&D Effort.

Detector R&D Studies and Beam Tests (2-120 GeV particles) at Fermilab Test Beam Facility (FTBF).

Prototype Designs: Secondary Emission Ionization Calorimetry and Novel Cherenkov Detector for PID.

Radiation Hard and High Light Yield Scintillating Materials R&D.

Characterization of Photomultiplier Tubes (PMTs) and SiPMs.

**CERN**

Researcher, Ph.D.

September 2010 - Present (15 years 4 months)

Geneva Area, Switzerland

Physics analysis, Majorana neutrino analysis, Monte Carlo simulations, detector R&D for particle colliders, calorimetric studies (for HF and HE calorimeters of the CMS), data acquisition systems, and electronic instrumentation.

Iowa State University

**Postdoctoral Research Associate**  
January 2017 - October 2020 (3 years 10 months)  
Fermilab, Batavia, IL, USA.

From January 2017 to October 2020, I worked on ANNIE and NOvA neutrino experiments at Fermilab as a postdoctoral research associate for Iowa State University (ISU). I served as a Run Coordinator and Detector Upgrade Manager for the ANNIE experiment. I was also the main person on-site at Fermilab to lead the detector upgrade research activities for ANNIE from January 2017 to October 2020 as an ISU researcher at Fermilab. In addition to my work on ANNIE, I also contributed early work to NOvA neutron detection and simulation efforts.

**The University of Iowa**  
6 years 5 months

**Ph.D. Candidate (as Research/Teaching Assistant)**  
August 2012 - December 2016 (4 years 5 months)  
Iowa City, IA, USA

#### RESEARCH EXPERIENCE:

- » Search for Heavy Majorana Mass Neutrinos in  $\mu\pm\mu\pm + \text{jets}$ ,  $e\pm e\pm + \text{jets}$ , and  $e\pm\mu\pm + \text{jets}$  events in pp collisions at 8 TeV at the LHC.
- » Radiation Hard & High Light Yield Scintillating Material R&D
- » R&D Studies for Secondary Emission Ionization Calorimetry
- » R&D Studies for Novel Cerenkov Detector for Particle Identification
- » Research in Directional Cherenkov Detectors
- » Characterization of PMTs for CMS Forward Calorimetry R&D
- » Fabrication with Atomic Layer Deposition (ALD) and Thermal Evaporation Techniques.

#### TEACHING EXPERIENCE:

- » Teaching undergraduate labs, and running discussion and tutorial sessions:
  1. Physics IV: Experiments in Special Relativity and Quantum Physics.
  2. College Physics II & Introductory Physics II: Experiments in Electricity, Magnetism, and Light.
  3. Basic Physics: Introduction to physics concepts and mathematical formulas to solve physics problems. Experiments in mechanics, electricity, heat, liquids, gases, and atomic, nuclear, and elementary particle physics.

August 2010 - July 2012 (2 years)  
Iowa City, IA, USA.

RESEARCH EXPERIENCE:

- » Working on the Phase-1 Upgrade of the Hadronic Forward Calorimeter (HF) of CMS at LHC.
  - » Analysis and performance studies of 1800 new and thin window four-anode PMTs at the quality control test station.
  - » Installation PMTs and testing the readout box prototype and light guide systems at the test beam facility at CERN before the installation in the CMS Experiment.
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## Education

University of Iowa

Ph.D., Experimental High Energy and Nuclear Physics · (2012 - 2017)

University of Iowa

Master of Science (MSc), Experimental High Energy and Nuclear Physics · (2010 - 2012)

University of Delaware

AE Certificate, ESL · (2009 - 2010)

Ataturk University

B.Sc., Physics · (2004 - 2008)