

# Lekshmi Thulasidharan

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## CONTACT INFORMATION

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## RESEARCH INTEREST

I am interested in Galactic Dynamics. I am currently working on constraining wobbling in the solar neighbourhood using kinematics from Gaia EDR3.

## EDUCATION

**University of Wisconsin Madison**, United States 2019 - present  
Graduate Student in Physics

**Central University of Tamil Nadu**, India 2014 - 2019  
Integrated M.Sc in Physics (CGPA: 9.52/10)

## RESEARCH EXPERIENCE

Research Project on **Wobbling in the Milky Way Disk**  
*Supervisor: Prof. Elena D'Onghia* Ongoing  
**University of Wisconsin-Madison**

Research Project on **IceCube-Gen2 Trigger Studies**  
*Supervisor: Prof. Albrecht Karle* Summer 2020  
**University of Wisconsin-Madison**

- Simulation studies to calculate the efficiency of different trigger configurations for IceCube Gen2 geometry.

Masters' Thesis on **Dark Matter in the Local Group**  
*Supervisor: Prof. Somak Raychaudhury* December 2018- April 2019  
**Inter-University Center for Astronomy and Astrophysics, Pune**  
*Co-Supervisor: Dr. M. Ponmurugan*  
**Central University of Tamil Nadu**

- Revisited the timing argument problem to estimate the mass of the Local Group, by including the effects of Dark Energy and Tidal effects.

Summer Research Project on  **$J/\psi$ ,  $\Upsilon$  and  $Z$  studies with CERN Open Data**  
*Supervisor: Dr. Achim Geiser* July-September 2018  
**Deutsches Elektronen-Synchrotron (DESY), Germany**

- The validation of 2010 Compact Muon Solenoid (CMS) open data is done for the full statistics, by successfully reconstructing the  $J/\psi$ ,  $\Upsilon$  and  $Z$  decay channels.

Summer Research Project on **Detection of Low Momentum muons with Belle detector**  
*Supervisor: Prof. Gagan Mohanty* Summer 2018  
**Tata Institute of Fundamental Research, India**

- Using  $J/\psi \rightarrow \mu^+ \mu^-$  decay channel as a control sample, we implemented 'Boosted Decision Trees' in ROOT, to calculate the muon identification efficiency and the fake rate using the information from the subdetectors other than the outermost KLM detector of the Belle experiment.

Summer Research Project on **Probing the Dark Matter Halo of the Milky Way**  
*Supervisor: Prof. Somak Raychaudhury* Summer 2017  
**Inter-University Center for Astronomy and Astrophysics, India**

- Mass determination of Milky Way was done by exploiting the kinematics of tracers in the Galactic Halo. Most recent data of tracers such as Globular Clusters, Dwarf Galaxies and K-Giant Stars were used.

IASc-INSNA-NASI Summer project on **Synthesis and Characterisation of Core/Shell Semiconductor Nanoplatelets by Colloidal Atomic Layer Deposition(CALD)Technique**

*Supervisor: Dr. Sameer Sapra*

*Summer 2016*

**Indian Institute of Technology, Delhi**

- Investigated the effect of thickness of shell as well as the surface terminating anionic and cationic layer on the optical properties of CdSe/CdS quasi-type-II system.
- The work has been published in an internationally peer reviewed journal.

TEACHING  
EXPERIENCE

Graduate Teaching Assistant

*Department of Physics*

*Fall 2019, Fall 2020*

**University of Wisconsin-Madison**

- Teaching assistant for calculus based Mechanics course for engineering students.
- Conducted weekly discussions and labs.

PUBLICATIONS

**Surface Decides the Photoluminescence of Colloidal CdSe Nanoplatelets Based Core/Shell Heterostructures**

<http://pubs.acs.org/doi/pdf/10.1021/acs.jpcc.7b09033>(DOI: 10.1021/acs.jpcc.7b09033)

CONFERENCES AND  
WORKSHOPS  
ATTENDED

Participated in **IceCube BootCamp**, at Wisconsin IceCube Particle Astrophysics Center (WIPAC)-UW Madison. (15-19 June 2020 ).

Participated in 8<sup>th</sup> **ARIES training school in Observational Astronomy (ATSOA)-2018**, at Aryabhata Research Institute of Observational Sciences, Nainital. (19-28 March 2018).

Participated in **Conference on Galactic Evolution and Dynamical Structures 2018** , at Inter-University Center for Astronomy and Astrophysics, Pune.(22-24 January, 2018)

Participated in **Refresher Course in Astronomy and Astrophysics**, as a part of the Vacation Students Programme organised by Inter-University Center for Astronomy and Astrophysics, Pune (May 15-June 16, 2017).

HONORS, AWARDS  
AND  
ACCOMPLISHMENTS

- Recipient of INSPIRE Scholarship from 2014-19(Funded by Department of Science and Technology, India).
- Invited by MHRD to witness 70<sup>th</sup> Republic day from the Prime Minister's box as a guest of Hon'ble Prime Minister of India, in recognition of the excellent academic performance.
- Fellowship: Summer Student Programme at Deutsches Elektronen-Synchrotron (DESY), Germany (July-September 2018).
- Fellowship: Visiting Students' Research Programme (VSRP), at Tata Institute of Fundamental Research, Mumbai (May-July 2018).
- Fellowship: Vacation Students Programme(VSP), The Inter-University Center for Astronomy and Astrophysics,Pune (May-July 2017).
- Fellowship: IASc-INSNA-NASI Summer Research fellow at Indian Institute of Technology, Delhi(May-July 2016) .

SKILLS &  
TECHNIQUES

**Statistical Tools**

Decision Trees in ROOT, Maximum Likelihood Parameter Estimation

**Programming Languages**

Python, Mathematica, Matlab, C++

**Operating Systems**

Windows, Linux

**Markup Languages**

Latex