

PERSONAL DETAILS

Name: Iman Ataee Langroudy
Birth: May 28, 1994, Tehran, Iran
Phone: +1 979 450 6596
Email: iman.ataee@tamu.edu

EDUCATION

Ph.D. in Physics (currently studying) September 2018-Now
[Texas A&M University](#), Texas, United States
[Department of Physics and Astronomy](#)
Current Cumulative GPA until now: 4.0/4.0

B.Sc in Mathematics September 2013-July 2018
[University of Tehran](#), Tehran, Iran
[School of Mathematics, Statistics and Computer Science](#)
Cumulative GPA: 17.98/20 (Ranked 2nd among peers)

B.Sc in Engineering Physics September 2012-July 2017
[University of Tehran](#), Tehran, Iran
[Department of Physics](#)
Cumulative GPA: 18.30/20 (Ranked 1st among peers)

RESEARCH INTERESTS

Computational Physics
Experimental High Energy Physics
Data Science
Cosmology
Mathematical Physics
Nanotechnology

RESEARCH PARTICIPATIONS

CDMS Simulation Group

September 2018-Now

Supervisor: [Dr. David Toback](#), Texas A&M University

Description: CDMS experiment studies the physics of the Dark Matter detector. Detector Monte Carlo software has been developed by Super CDMS to simulate phonon and charge propagation within the detectors in addition to detector read out (for both charge and phonons). I'm contributing to CDMS experiment by simulating the response of the dark matter detector to known sources. The results from this monte carlo simulation will be used to analyze real experiment data. We expect to find evidence of dark matter, possibly in the form of WIMPs.

Design and implementation of micro-controller-based circuit board for multichannel data acquisition

2015

Supervisor: [Dr. Farrokh Sarreshtedari](#), University of Tehran

Description: In this project, we have designed and implemented an interface board based on ATmega16 AVR micro-controller for 16channel data acquisition from an ion-accelerator. The collected signals are transferred to a computer for online monitoring of the voltage distribution pattern in a specific part of the system.

BACHELOR THESIS

Schwarzschild Geometry (in Persian)

Spring 2018

Description: In this project, I introduced and studied the required concepts and tools on differential geometry in order to understand Schwarzschild Geometry and then I introduced the Schwarzschild metric. I reviewed manifold concepts, then, I generalized derivation and differentiability from Euclidean space to manifolds. I continued with introducing tangent vectors and tangent spaces and their basis and then I introduced vector fields and one forms. I generalized tensor concept to be defined on the manifolds. By symmetric bilinear forms, I analyzed scalar product as scalar product is a necessary concept to begin studying the semi-Riemannian manifolds. Then I defined semi-Riemannian manifolds and I introduced some strong differential geometric tools like isometry, geodesic of a manifold, and connection. I introduced Schwarzschild Geometry and at last I gave a brief explanation of Schwarzschild black holes.

PROJECTS

Multivariate Data Analysis of a Higgs experiment using ROOT TMVA

Fall 2019

Supervisor: [Dr. Alexei Safonov](#), [Texas A&M University](#)

Description: In this project, I did multivariate analysis by using ROOT TMVA tools on a Higgs experiment. I trained and tested the tools with a set of signal and background data generated by theoretical models and then applied the trained tools on the Higgs experiment to get the most signal vs background efficiency. At last, by using a background-only model, I calculated the P-Value of the dataset to explain if the dataset is a discovery or a background fluctuation.

Molecular Dynamics program with C++

Spring 2016

Supervisor: [Dr. Seyed Mehdi Vaez Allaei](#), [University of Tehran](#)

Description: In this project I've developed a Molecular Dynamics Program for twenty molecules, including Lennard-Jones potential, with periodic boundary conditions and a cut-off radius for each molecule. This program was able to calculate temperature, pressure and heat capacity of a system at any given time and track the position of molecules, with random or given initial conditions (position of molecules and cell size with Isothermal or Adiabatic conditions). The position tracking feature of this program gave me the opportunity to gather these data in an output file that not only helped me visualize molecules movements as a short movie, but also helped me draw plots to show how the system and variables react to freezing or heating.

Diffusion Factor calculation Program with C++

Fall2016

Supervisor: [Dr. Yaser Abdi](#), [University of Tehran](#)

Description: In this project I wrote a C++ program to calculate the diffusion factor of a semiconductor which can be customized at the beginning of the program. This program is able to simulate movements of an electron through a semiconductor which contains 10^6 cells. Each cell is an energy trap with a random energy which is generated at the start of the program on a given interval. At each step the simulated electron can move to any neighbor cell, by a random factor, given that the cell's energy is above the fermi energy which is given. Each time an electron moves to a neighbor, the program calculates the waiting time which is the time that an electron spends to move from that cell to the chosen neighbor. Also, in each movement the electron may recombine and the program is able to include this chance by a given factor which can be given before the program starts. At last, when the electron recombine, the distance and the total time spent between the starting point and the recombination point will be calculated. The program is able to repeat this process as many times as the user wants it to. At the end, the diffusion factor of the semiconductor will be calculated and stored into an output file.

PRESENTATIONS

Multivariate Data Analysis of a Higgs experiment using ROOT TMVA

Fall 2019

Description: In this presentation, I presented my project's results.

Neyman Confidence Belt

Fall 2019

Description: In this presentation, I reviewed frequentist approach to analyse data and experiment outputs. Then I reviewed Neyman Confidence Belt method and overcoverage and undercoverage. At last I introduced Feldman-Cousins method.

Lyapunov Function in Physics

Spring 2017

Description: In this presentation, I reviewed how Lyapunov function can be related to Energy function in physics. Also, I described how Lyapunov function can explain all kinds of equilibrium points in a Pendulum problem with and without air friction.

Evolution of Light sources

Spring 2016

Description: In this presentation, I reviewed the evolution of light sources in history, from Arc Lamps to LEDs. Then I described how each one of these light sources work. Also, I gave some examples of their applications in history.

Linear Programming Duality on Economy

Spring 2017

Description: In this presentation, I demonstrated what a dual problem in linear programming in economics means, followed by proofs and examples.

PROFESSIONAL DUTIES

Brazos Cluster Administration Trainee

September 2018-Now

Description: Brazos Cluster is a major computing cluster at Texas A&M University. I'm working on Brazos cluster as both User and Administrator Trainee. I'm getting trained to monitor the performance of the cluster, fix the potential problems with the cluster, and help the users to use the cluster effectively.

Toback Research Group Website Admin

September 2018-Now

Description: I'm maintaining and updating [Dr. Toback Research Group website](#) as the admin. The duties are uploading group member's talks, uploading and creating guides for the group members and new members, updating news, and enhancing the website structures.

TEACHING AND WORK EXPERIENCE

Physics 206 — Mechanics	Spring 2020
Recitations TA, Undergraduate level, Texas A&M University	
Physics 207 — Electricity and Magnetism	Fall 2019
Recitations TA, Undergraduate level, Texas A&M University	
Physics 202 — Electricity and Magnetism	Summer 2019
Recitations and Laboratories TA , Undergraduate level, Texas A&M University	
Physics 401 — Computational Physics	Spring 2019
Grader , Undergraduate level, Texas A&M University	
Physics 109 — Big Bang, Black Holes, No Math	Fall 2018
Recitations and Laboratories TA, Undergraduate level, Texas A&M University	
General Physics	Fall2014, Fall2017
Recitations TA, Undergraduate level, University of Tehran	
Electronics 1	Spring 2015
Recitations TA, Undergraduate level, University of Tehran	
Logic Circuits	Fall 2015
Recitations TA, Undergraduate level, University of Tehran	
Photoshop Graphic Designer	Since Fall 2016
Recitations TA, Designing Tshirts, Bussiness Cards and Menus	
HighSchool Physics and Mathematics Private Tutor	Since Fall 2013

PROFESSIONAL EXPERIENCES

Council member of award winning Scientific Society of Physics Students ,University of Tehran	2016-2017
Council member of Scientific Society of Mathematic Students , University of Tehran	2015-2016
Council member of "Noon va Ghalam" Charity, University of Tehran	2017-2018
Coordinator of the "Introduction to Different Fields of Study in Physics" sessions	2016-2017
Coordinator of the "Introducing University of Tehran Physics Faculty Researchers Fields to Undergraduate Students" conferences	Fall 2016
Coordinator of "Application of Mathematics in Physics" conference which lectured by Prof. Noorbala	Spring 2016
Exhibitor of University of Tehran Physics Department's Booth at World Science Day for Peace and Development's fair	Fall 2012
Coordinator of "University of Tehran, Physics Department Open day"	May 3-4, 2017

SKILLS

Languages	Farsi (Native) English(Fluent) Arabic(Basic)
Typesetting	L ^A T _E X Microsoft Office
Programming	C/C++ Java ROOT CERN Assembly Python HTML, JavaScript, CSS
Scientific Software	MATLAB Mathematica Visualize Molecular Dynamic (VMD)
ParallelComputing	MPI OpenMP
OS	Linux Microsoft Windows
Graphics Software	Photoshop Corel Photo-Paint
Circuit Design Software	PSpice Altium Designer

Conferences, Schools and Workshop Attended

SuperCDMS Collaboration Meeting 2020	January 9-12, 2020
Texas A&M University Physics and Astronomy Department Colloquiums	2018-Now
Non-Equilibrium Statistical Systems, Sharif University of Technology , Tehran, Iran.	May 12, 2016
5 th Conference of Particle Physics and Fields, Shahid Beheshti University & Physics Society of Iran, Iran.	February 17-19, 2015
National Conference of Cosmology and Gravitation Shahid Beheshti University & Physics Society of Iran, Iran.	January 30-31, 2013
5 th Conference of Statistical Physics, University of Tehran & Physics Society of Iran, Iran.	December 5-6, 2012
Weekly Seminars in Cognitive Science, School of Cognitive Science, IPM , Tehran, Iran.	2013-2018

HONORS & AWARDS

Ranked 1st among 36 students, Department of Physics,
University of Tehran

Ranked 2nd among 33 students, School of Mathematics,
Statistics and Computer Science University of Tehran

Outstanding Student, Department of Physics, University
of Tehran

Accepted in Nationwide Computer Olympiad first stage 2008, 2009, 2010

Accepted in Nationwide Mathematics, Physics and Astronomy
Olympiad first stage 2010

Full Financial Support, Ph.D. in Physics Texas A&M University 2018-now

Governmental Full Tuition Waiving Fellowship, B.Sc. in
Engineering Physics University of Tehran 2012-2017

Governmental Full Tuition Waiving Fellowship, B.Sc. in
Mathematics University of Tehran 2013-2018

INTERESTS

Science, Philosophy, History(especially Middle Ages), Massive Multiplayer On-
line Games, Music, Programming, Socializing