UNIVERSITÀ DEGLI STUDI DI MILANO

TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO ID CODE 5532_____

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at **Dipartimento di Fisica Aldo Pontremoli**_____

Scientist- in – charge: Prof. Zaccone_____

[Name and surname]

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Shakerpoor
Name	Alireza

PRESENT OCCUPATION

Appointment	Structure
N/A	N/A

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree			
Specialization			
PhD	Theoretical Chemistry	Colorado State University	2022
Master	Chemistry	Sharif University of Technology	2014
Degree of medical specialization			
Degree of European specialization			
Other			

REGISTRATION IN PROFESSIONAL ASSOCIATIONS

Date of	Association	City

registration		
N/A	N/A	N/A

FOREIGN LANGUAGES

Languages	level of knowledge
English	Fluent
Persian	Native

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2020-2021	Chemistry Department Graduate Student Travel Award, awarded at Colorado State University to competitive researchers to present their work at conferences and seminars.
2012	Iran National Graduate School Entrance Exam: Ranked 17th in Physical Chemistry (among >8000 participants)

TRAINING OR RESEARCH ACTIVITY

description of activity I am a Ph.D. graduate in Theoretical Chemistry with six years of experience in a computational field that heavily relied on numerical and applied math techniques. I believe my expertise and research enthusiasm will enable me to enhance the research at Dr. Zaccone's group.

My role as a research assistant at CSU was focused on performing numerical simulations to model glasses as well as predicting the stochastic behavior of self-propelled systems known as active particles. My research also required mathematical modeling of such systems whose prediction was tested against the simulation results. During this time, I gained extensive experience in molecular dynamics simulation, probabilistic analysis and stochastic analysis. All the simulations and numerical analyses were carried out through the codes that I wrote in C and at times in Python. Besides, I have a lot of experience working in the bash environment to analyze big data files and have written bash scripts to automate program execution and data analysis. I am quite familiar with different machine learning and neural network algorithms for structured data and have worked with different Python's computational libraries such as Scikit-learn, Pandas, NumPy, etc. Throughout my teaching experience, I have taught different undergraduate and graduate level courses since earning my master's degree.

PROJECT ACTIVITY

Year	Project
2017-2018 & 2021-2022	**Determining the Probability Distribution of non-interacting AOUPs:** This project involved the derivation of analytical expressions for the probability distribution and the transport coefficients of non-interacting self-propelled active Ornstein-Uhlenbeck particles (AOUPs) in an external potential. This modeling was carried out through an approximation method known as the Unified Colored

	Noised Approximation (UCNA) whose results were compared to an independent report on the Brownian particles. Further, I calculated the resultant parameters of the theory numerically and compared the results to the simulations to examine the extent of the model's validity.
2018-2020	**Interplay Between Stability and Disorder of Glasses:** In this project I examined the interplay between an amorphous solid's stability and the extent of disorder in its elastic matrix. The goal was to establish if the so-called fully-local approach, applied to measuring the local elasticity, would regenerate the predictions of the Fluctuating Elasticity Theory (FET) for the disorder parameter and the spatial correlations in the solid's structure. Through this method, I determined that the simulations qualitatively supported the predictions of the FET, but quantitatively I found a stronger dependence of the disorder parameter on the stability of the solid than what was predicted by the FET.
2019-2021	**Determining the Probability Distribution of a Tagged AOUP:** This project involved mathematical modeling of interacting AOUPs, to derive an exact expression for the probability distribution function of a tagged/tracer particle within the active system. I performed this derivation which aimed to be valid beyond the linear response regime whose scope is limited to the systems in thermal equilibrium or weakly perturbed systems. Through computer simulations, I tested the resultant mathematical formulation for a range of weakly to strongly out-of-equilibrium systems of AOUPs.
2013-2014	Designing pH-Sensitive and Thermosensitive Polymer-based Nanoparticles Prepared as Nanaocarriers.
2010	Preparation of High-yield, Green Polymer-based Palladium Nanocatalysts Throughout an Undergrad Independent Study.

PATENTS

Patent
N/A
N/A

CONGRESSES AND SEMINARS

Date	Title	Place
2021	APS March Meeting	Virtual
2021	Santa Fe Institute	Virtual Workshop
2021	CECAM (Centre Européen de Calcul Atomique et Moléculaire)	Virtual Workshop
2014	Third Theoretical and Computational Workshop on Electron Correlation	Tehran, IRAN

PUBLICATIONS

Books
Book Review: Physical Chemistry for Engineers, James E. Patterson, 1st ed., Cognella Academic Publishing, San Diego, 2022.

Articles in reviews
The Einstein effective temperature can predict the tagged active particle density, **A. Shakerpoor**, E. Flenner, and G. Szamel, J. Chem. Phys (2021)
Stability dependence of local structural heterogeneities of stable amorphous solids, **A. Shakerpoor**, E. Flenner, and G. Szamel, Soft Matter (2020)
A systematic deviation from the exact theory of Brownian motion : density distribution, current, and self-diffusion of an active particle in a tilted periodic potential, **A. Shakerpoor** and G. Szamel, (In preparation)

Congress proceedings
[title, structure, place, year]
[title, structure, place, year]
[title, structure, place, year]

OTHER INFORMATION

Teaching and Mentoring Experience
Undergraduate Level 2016-2022, Colorado State University, Fort Collins, USA > Physical Chemistry II (Spring 2017, 2018, 2020, 2021) > Physical Chemistry Lab (Spring 2017) > General Chemistry Lab (Fall 2016, 2021)
Graduate Level 2017, Colorado State University, Fort Collins, USA > Statistical Mechanics (Fall 2017) > Quantum Mechanics (Fall 2017)

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Please note that CV WILL BE PUBLISHED on the University website and It is recommended that personal and sensitive data should not be included. This template is realized to satisfy the need of publication without personal and sensitive data.

Please DO NOT SIGN this form.

Place and date: __Isfahan, IRAN___, ___03/12/2022_____