Kecai Xuan

Curriculum Vitae

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EDUCATION

JUL.2023 – PRESENT **Research Intern**
Department of Chemistry
University of Wisconsin - Madison

SEP.2020 – PRESENT **Undergraduate**
Department of Chemical Physics
University of Science and Technology of China

Overall GPA: 3.68/4.30
Major: Chemical Physics
Selected Courses: Mathematical Analysis (B1 - 90, B2 - 90)
Linear Algebra (87)
Advanced Linear Algebra (95)
Probability & Mathematical Statistics (85)
Stochastic Processes (87)
Mechanics (88)
Electromagnetism (86)
Theoretical Mechanics (97)
Quantum Physics (EN) (85)
Statistical Mechanics (88)
General Chemistry (96)
Inorganic Chemistry (90)
Organic Chemistry (98)
Physical Chemistry (EN) (87)
Fundamentals of Chemical Kinetics (90)
Progress in Chemical Physics (90)
Experiment of Inorganic Chemistry (90)
Experiment of Analytical Chemistry (90)
Experiment of Organic Chemistry (85)
Experiment of Physical Chemistry (85)
Instrumental Analysis Lab (85)
Mathematical Software (90)
Computer Programming (95)
Python and Deep Learning Basics (84)

RESEARCH

Physicochemical properties of biological phase transitions and their effects on intracellular biochemical reactions and functions

1. Simulated the liquid-liquid phase separation (LLPS) phenomenon in bio-systems.
2. Drawn and discussed the phase diagram of the LLPS.
3. Estimated and calculated the transport properties of the separated droplets.
4. Investigated and explained the mechanism of LLPS, speculated the relationship to the intercellular reaction and function.

Supervisor: Prof. **Zhonghuai Hou**, Department of Chemistry and Material Science, USTC
Supported by: College Student Research Program, Ministry of Education, China

Ab Initio Raman Spectra Calculation

1. Derived the basic relationship between the Raman polarizability tensor and the molecular states.
2. Followed the correlation function formalism of Raman scattering and found the prefactor between classical correlation and quantum correlation for AIMD calculation.
2. Working on the Python implement of CNEO into Raman spectra.

Supervisor: Prof. **Yang Yang**, Department of Chemistry, UW-Madison
Supported by: Council on International Educational Exchange, USA

SELECTED AWARDS

2023 **Outstanding student scholarship** (10%)
University of Science and Technology of China

2022 **Excellent Student Scholarship of GIES** (10%)
Guangzhou Institute of Energy Conversion, CAS

2021 **Huang Minglong Scholarship of SIOC** (10%)
Shanghai Institute of Organic Chemistry, CAS

2021 **Scholarship of Lu Jiaxi Talant Program** (5%)
University of Science and Technology of China

2021 **2nd Prize, Chinese Mathematics Competition**
Chinese Mathematical Society

LITERATURE

Book: Introduction to Statistical Mechanics

Notes for Statistical Mechanics, highlighting on conceptual consistency and logical coherence, full of insights and discussions, available online at **Github**.

Article: The Analysis of USTC

Critical thoughts towards the rat race in our school, Claiming that the Truth and Liberty shall become our unshakable belief, available online at **USTC Forum**.

Article: The Faults of Zhiyong

Pointing out the Org Chem lecturer's misconducts in classical Chinese, reported this to the Forum of Students and Teachers, available online at **icourse.club**.

SKILLS

EXPERT Mathematica, C#, LaTeX, Python

INTERMEDIATE Linux, MATLAB, LAMMPS, Gaussian