

# Chih-Tsun Yang

APPLYING TO THE DOCTOR OF PHILOSOPHY IN CHEMISTRY PROGRAM AT UNIVERSITY OF COLORADO – BOULDER

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## Education

### National Tsing Hua University

B.S. IN CHEMISTRY, MINOR IN COMPUTER SCIENCE

Hsinchu, Taiwan

Sep. 2014 – Jun. 2018

### National Tsing Hua University

M.S. IN PHYSICAL CHEMISTRY

Hsinchu, Taiwan

Sep. 2019 – Aug. 2021

## Research & Working Experience

### Undergraduate Research & Research Assistant

PROF. CHIN-HUI YU'S LAB, DEPARTMENT OF CHEMISTRY, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

Jan. 2017 – Mar. 2019

#### Research Project Topic:

"Using Constrained Multi-Coordinate Driven Method to Study the Regioselectivity in Hydroxybenzyl Alcohol Formation Under Alkaline Aqueous Environments"

- Using the constrained reduced dimensionality (CRD) algorithm, incorporate with Gaussian 09, to study how phenol and formaldehyde forms Hydroxybenzyl Alcohol in Alkaline Aqueous Environment.

#### Computational Cluster & Network Management:

- Managed and maintained the Linux-based computer cluster(30+ PCs) in our lab.
- Successfully compiled and deployed Gaussian 16 in our computational cluster.

### Master Degree Research

PROF. LI-KANG CHU'S LAB, DEPARTMENT OF CHEMISTRY, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

Sep. 2019 – Aug. 2021

#### Thesis Topic:

"Investigating the Protein Dynamics of Human Serum Albumin in Hypothermic and Normalthermic Conditions with Temperature Jump"

- Developed a tryptophan-based fluorescence temperature jump system to study the thermally-induced dynamic process of human serum albumin.

#### Side Project 1: Nanosecond Transient Absorption Spectrometer

- Constructed a nanosecond transient absorption spectroscopy system which uses ICCD as detector.
- Programmed an automation acquisition script in PI's WinSpec to automatically acquire the spectrum.

#### Side Project 2: Upgrade the Data Acquisition Part of a Stopped-flow Apparatus

- Replace the ADC card on an old stopped-flow apparatus, and redo the data acquisition components.
- Developed a new software in Java, including the data collection and the user interface.

### Research Assistant

DR. KUO-HUA HUANG'S LAB, INSTITUTE OF MOLECULAR BIOLOGY, ACADEMIA SINICA

Taipei, Taiwan

Sep. 2021 – Aug. 2022

#### Research Project Topic:

"Constructing Virtual Animal Models and Virtual Reality Environment to Allow Future Study on the Roles of Reciprocal Interaction in Zebrafish Social Behavior"

- Constructed a virtual zebrafish models in Blender, and a virtual reality(VR) environment in Unity.
- Developed a close-loop VR system, including images acquisition, real-time image processing, and VR updating.
- Utilized Python to analyze the behavior motif of freely-swimming zebrafish to make the animation more realistic.

## Teaching Experience

### Volunteer Teaching Assistant of Undergraduate Courses

CENTER FOR GENERAL EDUCATION, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

2014 Fall – 2016 Spring

Forensic Science and Crime Prevention(2014 Fall, 2015 Fall) & Crime Investigation Technology (2015 Spring, 2016 Spring)

### Teaching Assistant of Undergraduate Courses

DEPARTMENT OF CHEMISTRY, NATIONAL TSING HUA UNIVERSITY

Hsinchu, Taiwan

2019 Fall – 2020 Spring

Physical Chemistry Laboratory I (2019 Fall) & Physical Chemistry II (2020 Spring)

## Honors & Awards

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### Excellent Poster Presentation Award

Taoyuan, Taiwan

2021 CHEMISTRY NATIONAL MEETING, CHEMICAL SOCIETY LOCATED IN TAIPEI

Mar. 13 – 14, 2021

"Thermally induced dynamic processes of Albumins probed with ICCD-embedded confocal fluorescent temperature jump system"

### Physical Chemistry Thesis Award – Honorable Mention

Taipei, Taiwan

2022 CHEMISTRY NATIONAL MEETING, CHEMICAL SOCIETY LOCATED IN TAIPEI

Mar. 11 – 13, 2022

"Investigating the Protein Dynamics of Human Serum Albumin in Hypothermic and Normalthermic Conditions with Temperature Jump"

### College of Science Elite Student Award

Hsinchu, Taiwan

COLLEGE OF SCIENCE, NATIONAL TSING HUA UNIVERSITY

2021 Spring

Awarded to the exceptional-performing student in the College of Science at NTHU

### Honorary Membership

Taipei, Taiwan

THE PHI TAU PHI SCHOLASTIC HONOR SOCIETY OF THE REPUBLIC OF CHINA

2021 Spring

Awarded to the excellence in academic performance as well as moral conduct

## Publications

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- (1) Yang, C.-T.; Chu, L.-K. Protein dynamics of human serum albumin at hypothermic temperatures investigated by temperature jump. *Phys. Chem. Chem. Phys.* **2022**, 24, 11079–11085.
- (2) Jian, H.-Y.; Yang, C.-T.; Chu, L.-K. Gaseous infrared spectra of the simplest geminal diol  $\text{CH}_2(\text{OH})_2$  and the isotopic analogues in the hydration of formaldehyde. *Phys. Chem. Chem. Phys.* **2021**, 23, 14699–14705.
- (3) Wang, P.-Y.; Yang, C.-T.; Chu, L.-K. Differentiating the protein dynamics using fluorescence evolution of tryptophan residue(s): A comparative study of bovine and human serum albumins upon temperature jump. *Chem. Phys. Lett.* **2021**, 781, 138998.

## Presentations

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### 1st author poster at the <2021 Chemical Society National Meeting>

Taoyuan, Taiwan

CHEMICAL SOCIETY LOCATED IN TAIPEI

Mar. 13 – 14, 2021

"Thermally Induced Dynamic Processes of Albumins Probed with ICCD-embedded Confocal Fluorescent Temperature Jump System"

## Language

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**Chinese** Native

**English** Fluent; TOEFL iBT score: 100 – R: 24, L:28, S:23, W:25 (Apr. 9, 2022)

## Technical Skills

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### CHEMISTRY & SCIENTIFIC INSTRUMENTS

#### Spectroscopy

Time-resolved absorption/fluorescence, Temperature-jump method, Steady-state IR/ATR absorption, Steady-state UV-Vis absorption, Steady-state fluorescence, Steady-state far-UV circular dichroism

#### Softwares

Gaussian 09/16, GaussView, Chemdraw, OriginLab, Gnuplot, Autodesk Fusion 360

### COMPUTER & PROGRAMMING

#### Programming

C/C++, C#, Python, Java, MATLAB, LabVIEW, VBA, VBScript, Bash/Shell, PHP/MySQL

#### IDE & Tools

Git, Vim, make, Visual Studio Code, Jupyter, Unity 3D

#### OS & System

Linux-based computer cluster management, Software installation & deployment, Network

#### Administration

management, Windows, Linux(Fedora, Ubuntu, CentOS), macOS

#### Softwares

Typesetting with  $\text{\LaTeX}$  engine, Microsoft Office, Adobe Illustrator, Blender

## Extracurricular Activities

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### Clarinetist & Bass Clarinetist in NTHU Wind Club

DIVISION OF STUDENT ACTIVITIES, NATIONAL TSING HUA UNIVERSITY

- Sep. 2015 – Aug. 2016: **President** of 26th NTHU wind camp
- Sep. 2016 – Aug. 2017: **Treasurer** of NTHU wind band

*Hsinchu, Taiwan*

*Sep. 2014 – Aug. 2018*

### Learning Assistant

HSINCHU DONG YUAN ELEMENTARY SCHOOL

*Hsinchu, Taiwan*

*Sep. 2014 – Dec. 2014*

### Volunteer Service

HSINCHU MACKAY MEMORIAL HOSPITAL

*Hsinchu, Taiwan*

*Mar. 2016 – Jun. 2016*