Xiong Kai Benjamin Chng

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EDUCATION

University of Rochester	Rochester, NY, USA
M.A., Physics	Aug 2021 – May 2022
GPA: 4.00/4.00	

University of Illinois Urbana-Champaign	Urbana, IL, USA
M.S., Electrical and Computer Engineering	Aug 2013 – May 2015
GPA: 4.00/4.00	

University of Illinois Urbana-Champaign	Urbana, IL, USA
B.S., Electrical Engineering, *with Highest Honors*	Aug 2011 – May 2013
GPA: 3.98/4.00	

HONORS AND AWARDS

- James M. Henderson Fellowship, Department of Electrical and Computer Engineering, University of Illinois, 2014 – 2015
- Timothy N. Trick Leadership Award, Department of Electrical and Computer Engineering, University of Illinois, 2014
- University Honors – Bronze Tablet, University of Illinois, presented to the top 3% of students in graduating class, 2013
- Dean's List for 4 semesters, University of Illinois, 2011 – 2013
- Defence Science & Technology Agency Scholarship, Singapore, 2011 – 2015

PUBLICATIONS

- Y Xu, **X K B Chng**, S G Adie, S A Boppart, and P S Carney, "Multifocal interferometric synthetic aperture microscopy," *Opt. Exp.,* 22, 16606-16618 (2014), DOI: 10.1364/OE.22.016606.
- **B X K Chng**, T van Dijk, R Bhargava, P S Carney, "Enhancement and Extinction Effects in Surface-Enhanced Stimulated Raman Spectroscopy," *Phys. Chem. Chem. Phys.,* 17, 21348-21355 (2015), DOI: 10.1039/C4CP05089D.

CONFERENCE PRESENTATIONS

- Yang Xu, **Xiong Kai Benjamin Chng**, Steven G. Adie, Stephen A. Boppart, P. S. Carney, "Multifocal interferometric synthetic aperture microscopy," OSA Frontiers in Optics, Orlando, October 2013.
- **Xiong Kai Benjamin Chng,** Thomas van Dijk, Rohit Bhargava, P. Scott Carney, "Enhancement and Extinction in Surface-Enhanced Stimulated Raman Spectroscopy," OSA Frontiers in Optics, Tucson, October 2014.
- **Chng Xiong Kai Benjamin,** "Characteristic Far-Field Analysis of Scattering due to Plane Wave Excitations," European Conference on Antennas and Propagation, Copenhagen, March 2020.

RESEARCH EXPERIENCE

Department of Physics, University of Rochester	Rochester, NY, USA
Graduate Research Assistant, *Advisor*: Prof. Pengfei Huo	May 2022 – Present

- Working on projects to understand the fundamental properties and mechanisms of exciton-polaritons with applications in quantum chemistry and quantum information science

Department of Electrical and Computer Engineering, University of Illinois / Beckman Institute for Advanced Science and Technology   Urbana, IL, USA
Graduate Research Assistant, *Advisor*: Prof. P. Scott Carney   Aug 2013 – May 2015

- Pursued research projects in optical physics with a focus on integrating imaging and spectroscopy within a unified framework
- Predicted enhancement of signals from stimulated Raman scattering (SRS) with metallic nanoparticles
- Worked on computed tomography scheme where the measured signal experiences saturated gain due to processes such as SRS

Department of Electrical and Computer Engineering, University of Illinois / Beckman Institute for Advanced Science and Technology   Urbana, IL, USA
Undergraduate Research Assistant, *Advisor*: Prof. P. Scott Carney   Jan 2013 – May 2013

- Conducted optical coherence tomography (OCT) simulations to provide data for testing multi-focal interferometric synthetic aperture microscopy (ISAM) technique

Department of Electrical and Computer Engineering, University of Illinois   Urbana, IL, USA
Undergraduate Research Assistant, *Advisor*: Prof. John M. Dallesasse   Aug 2012 – Dec 2012

- Set up testing station for optical and electrical measurements of the light-emitting transistor

Department of Physics, University of Illinois   Urbana, IL, USA
Undergraduate Research Assistant, *Advisor*: Prof. Paul G. Kwiat   Nov 2011 – Jul 2012

- Worked on single mode coupling of optical fibers and alignment of optical cavities in the development of a single photon storage device

TEACHING AND MENTORING EXPERIENCE

Department of Physics, University of Rochester   Rochester, NY, USA
Graduate Teaching Assistant   Aug 2021 – May 2022

- Taught undergraduate electromagnetism which covers electrostatic and magnetostatic systems, boundary value problems in electromagnetism, and dielectric and magnetic materials
- Supervised undergraduate lab for modern physics that teaches quantum theory and atomic, molecular, and optical physics. Lab covers key concepts such as wave propagation, properties of lens, diffraction, and atomic spectra

DSO National Laboratories   Singapore, Singapore
Internship Mentor   Jun 2020 – Aug 2020

- Mentored undergraduate student from the National University of Singapore (NUS) on characteristic mode analysis (CMA) for antenna design
- Taught intern some techniques from computational electromagnetics (CEM), such as the method of moments, and demonstrated how to use engineering software with CEM functionalities

DSO National Laboratories   Singapore, Singapore
Instructor   Jun 2018, 2019

- Taught a class on electromagnetism and wave scattering for Grade 11 students to promote interest in science, technology, engineering, and mathematics (STEM)
- Created and organized a laboratory experiment to illustrate the physics of wave scattering for these students

PROFESSIONAL EXPERIENCE

DSO National Laboratories   Singapore, Singapore
Research Engineer   Jun 2015 – Aug 2021

- Established and led work on characteristic modes for analysis and solution in antenna design, electromagnetic compatibility, and scattering problems

- Formulated and led development of codes for the computation of characteristic modes
- Characterized installed antenna performance on electrically large platforms using CEM codes such as FEKO
- Analyzed and simulated behavior of metamaterials for electromagnetic applications

DSO National Laboratories   Singapore, Singapore
Research Intern   Jun 2013 – Aug 2013
- Performed simulations of phased antenna arrays to relate geometry of individual antenna elements to resultant radiation pattern
- Helped validate phased array designs that have better co-polarization to cross-polarization discrimination

Defence Science & Technology Agency (DSTA)   Singapore, Singapore
Electrical Engineering Intern   Feb 2011 – Aug 2011
- Evaluated proposals for alternative energy generation, distribution, and storage; proposals were provided by both academic and industry partners
- Investigated feasibility of renewable energy sources, such as wind turbines, solar panels, and fuel cells, in a tropical environment

TECHNICAL SKILLS

Programming languages, proficient in: Matlab, Python
Programming languages, familiar with: C, C++, Fortran, Lua, Mathematica
Computer aided design/engineering: SolidWorks, Altair FEKO, Ansys HFSS, CST Microwave Suite, NX I-DEAS
Others: Linux (openSUSE, Ubuntu), PETSc, SLEPc