

# YU KAI TAN

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## EDUCATION

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### University of Michigan

*PhD. in Ecology & Evolutionary Biology (expected 2027)*

**Ann Arbor, MI**

August 2022 - Present

### Wesleyan University

*Master of Arts (M.A.) in Earth & Environmental Sciences*

**Middletown, CT**

May 2021

**Thesis: Quantitative Systematics and Shell Sculpture Biogeography of Fresh Water Clams (Order Unionoida): a view from the late 19<sup>th</sup>- early 20<sup>th</sup> Century** *GPA: 4.22/4.00*

- ❖ Curated, photographed and digitized an orphaned 19<sup>th</sup> century collection comprising of ~2000 specimens, 155 mussel species in 402 specimen lots
- ❖ Analysed morphometry of specimens for identification of species with no obvious diagnostic traits
- ❖ Developed 3D volumetric analysis of shells to quantify resource allocation gradient along a river cline
- ❖ Mapping of all shell sculpture occurrences in North America using ArcGIS

*Bachelor of Arts (B.A.) Triple Major: Biology, Earth & Environmental Sciences, and Anthropology* May 2020  
*Phi Beta Kappa GPA: 3.82 / 4.00*

**Thesis (High Honors): Worlds Apart: Being(s) in Place in the Penang Botanic Gardens**

- ❖ Freeman Asian Scholarship: four-year merit-based scholarship awarded to one student from Malaysia each year
- ❖ Departmental High Honors in Anthropology

### Methodist College Kuala Lumpur (MCKL)

*Cambridge International Education Advanced Levels (A-Levels) A\*AA*

**Brickfields, Kuala Lumpur**

### Chung Ling High School (Public) Penang

*SPM (Cambridge O-Levels equivalent: Malaysian Certificate of Education) 8A+ 2A 1A-*

**Georgetown, Penang**

## RESEARCH EXPERIENCE

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### Smithsonian National Museum of Natural History

*Kenneth Jay Boss Research Fellow. Advisor: Dr. John Pfeiffer*

**Washington DC**

June 2021 – Present

- ❖ Proposed grant-funded fellowship research titled “Revisiting Freshwater Mussel Variation (Family: Unionidae) Along a River Gradient”
- ❖ Collect and analyse morphometric data on digitised freshwater mussel specimens
- ❖ Determine shell morphology responses to river position and environment

### Wesleyan University

*Graduate Researcher and Museum Assistant. Advisor: Professor Ellen Thomas*

**Middletown, CT**

June 2020 – Present

- ❖ Manage an independent Master’s thesis research project using historical collections of freshwater mussels

- ❖ Research archival documents to compile metadata on collections and identify type specimens
- ❖ Update epithet and generic nomenclature on 500 specimen lots for digitisation
- ❖ Acquire and setup equipment to image specimens in standard positions
- ❖ 3D scanning of specimens to reveal shell sculpture functional traits and for geometric morphometry
- ❖ Investigate the viability of quantitative traits as diagnostic features for species determination via ImageJ
- ❖ Create phylogeny and maps of the occurrences of shell sculpture as a functional trait in North America to reconstruct dispersal patterns and radiation centres using ArcGIS

*Research and Teaching 3D Model Assistant.* Advisor: Professor Katherine Brunson June 2020 – Present

- ❖ Developed and optimised protocols for scanning 3D models of collection objects using Artec Space Spider
- ❖ Innovated techniques to create scans for objects that the scanner manufacturer claimed impossible
- ❖ Trained students and faculty on creating 3D models and on using them in virtual teaching

*Student Research Assistant.* Advisor: Professor Sonia Sultan April 2020 – Present

- ❖ Cleaned and cold-stratified 15,000 *Persicaria maculosa* achenes for full factorial common garden experiment on transgenerational phenotypic plasticity
- ❖ Sowed, transplanted and cared for 800 plants throughout the summer grow season
- ❖ Assisted in collecting phenotypic and transcriptomic data and harvesting end-season tissue and achenes

*Senior Research Seminar.* Advisors: Prof. Suzanne O'Connell; Prof. Timothy Ku September 2019 – March 2020

- ❖ Designed an independent field experiment on intraspecific phenotypic plasticity within a single genetic population of Hawai'ian gastropods in response to climate and predation pressures (Family: Neritidae)
- ❖ Planned and executed field data sampling and morphometric data collection on Big Island, Hawai'i

## **Joe Webb Peoples Museum of Natural History**

**Middletown, CT**

*Assistant Curator.* Advisors: Prof. Ellen Thomas; Prof. Ann C. Burke

September 2017 – Present

- ❖ Customised and optimised the Specify7 iDigBio database for digitising the collections
- ❖ Restored over 50 fossil casts including large Ward Casts of *Mosasaurus*, *Glyptodon* and *Deinotherium*, 6-foot *Scheenstia maximus*, Plesiosaurs and Ichthyosaurs for display and teaching
- ❖ Designed and curated two large-scale special exhibitions, entitled *Shekving the History of Life* and *Tree of Life*
- ❖ Promoted public access to natural history collections through museum tours, *Specimen of the Month* exhibition, social media, blogs and ArcGIS storymaps

## **Paleontological Research Institution**

**Ithaca, NY**

*Collections and Exhibits Intern.* Advisor: Prof. Gregory Dietl

June 2019 – July 2019

- ❖ Processed and integrated a major donation of 4,200 lots of specimens into archival collections facility
- ❖ Designed and curated an exhibition on the value of taxonomic collections in research
- ❖ Partial curation of the entire coral and sponge collection of over 10,000 lots

## **PrIME Biologics Singapore Pte. Ltd.**

**Singapore**

*Research Intern*

January 2016 – June 2016

- ❖ Conducted human plasma fractionation of human serum albumin and immunoglobulin-G via polyacrylamide membrane electrophoresis
- ❖ Optimized laboratory protocols for endotoxin testing, HPLC-SEC albumin and immunoglobulin-G analysis, protein quantification and pharmaceutical stability testing

## PRESENTATIONS & PUBLICATIONS

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**Tan, Yu Kai**, Burke, A. C., Thomas, E. (2021) Out of Their Shells: Digitisation of Endangered Diversity in Orphaned Collections Spurs Access and Discovery. *Curator: The Museum Journal*.

**Tan, Yu Kai**, Tan, A., Ku, T. C. W., OConnell, S. (2021) Shapeshifter: Rapid Shell Adaptation to Thermal Pools in Hawaiian Marine Nerites. *Journal of Molluscan Studies*. *In Preparation*.

**Tan, Yu Kai**. (2021). Out of Their Shells: An Orphaned Freshwater Mussel Collection Viewed in 3D Illuminates Biogeography. *Masters Thesis for the Department of Earth & Environmental Sciences: Wesleyan University*. Retrieved from <https://doi.org/10.14418/wes01.3.127>

**Tan, Yu Kai**. (2020). Worlds Apart: Being(s) in Place at the Penang Botanic Gardens. *Honors Thesis for the Department of Anthropology: Wesleyan University*. Retrieved from <https://doi.org/10.14418/wes01.1.2343>

### **World Congress of Malacology 2022**

**Munich**

Tan, Andy Dick Yee, **Yu Kai Tan**, John M. Pfeiffer, Ann C. Burke, Ellen Thomas (2022) “Cost of living: Morphometry reveals patterns of clinal variations in US freshwater mussels (family Unionidae)”, Abstract CON-15, 1 – 5 Aug

### **Geological Society of America Connects 2021**

**Portland**

**Tan, Yu Kai**, Andy Tan Dick Yee, Ellen Thomas, Ann C. Burke (2020), “3D Morphometry Quantifies Cost of Ecophenotypic Covariance in Freshwater Mussels”, Abstract 356925, presented at Geological Society of America Connects 2021, 10-13 Oct

### **Northeast Geobiology Symposium 2021**

**Hanover**

**Tan, Yu Kai**, Andy Tan Dick Yee, Ann C. Burke, Ellen Thomas (2020), “Orphaned Freshwater Mussels Collection Reveals Biogeography of Sculptured Species”, Oral Presentation, presented at Northeast Geobiology Symposium 2021, 9-10 April

### **Geological Society of America Meets Online 2020**

**Virtual**

**Tan, Yu Kai**, Andy Tan Dick Yee, Ellen Thomas, Ann C. Burke (2020), “Freshwater Mussels of North America: Museum Collections and Pre-industrial Biogeography”, Abstract 356925, presented at Geological Society of America Meets Online Meeting 2020, 26-30 Oct

❖ Best Student Poster Presentation Award in the Geobiology and Geomicrobiology Division

### **Geological Society of America Meets Online 2020**

**Virtual**

Tan, Andy (Dick Yee), **Yu Kai Tan**, Ellen Thomas, Ann C. Burke (2020), “Monster in the Library: A Novel Presentation of an Old Mosasaur Specimen”, Abstract 356929, presented at Geological Society of America Meets Online Meeting 2020, 26-30 Oct

**Annual Meeting of the Society for the Preservation of Natural History Collections 2019** Chicago  
Thomas, Ellen, Ann C. Burke, Yu Kai Tan, Andy Tan (2019), “Natural History Museums in Liberal Arts Education” Making the Case for Natural History Collections, Abstracts 199-200; doi: 10.17605/OSF.IO/EYAGC, 27-31 May

**America Geophysical Union Fall Meeting 2018** Washington DC  
Tan, Yu Kai, Andy Tan Dick Yee, Ellen Thomas, Ann C. Burke (2018), “Value of Natural History Collections in Liberal Arts Education”, Abstract ED23E-0951, 10-14 Dec

## TEACHING EXPERIENCE

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**Wesleyan University** Middletown, CT  
*Teaching Apprentice, Mass Extinctions in the Oceans in the Anthropocene* September 2020 – December 2020

- ❖ Create 3D-models of fossils and facilitate weekly in-person socially-distanced fossil viewing sessions
- ❖ Manage contents, activities and resources for Moodle, the online course portal
- ❖ Hold weekly office hours to assist students with problem sets, presentations and fossil identification

## OTHER EXPERIENCES

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**Spring: First Solo Art Exhibition** Penang, Malaysia  
*Artist & Curator* June 2017 – August 2017

- ❖ Created and curated over 40 pieces of paintings for exhibition, all pieces sold
- ❖ Organised and publicized gallery opening, acknowledged, and attended by Penang State Chief Minister and world-renown artists

## AWARDS & HONORS

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Kenneth Jay Boss Fellowship, Smithsonian National Museum of Natural History (\$8370) June 2021  
*Member, Phi Beta Kappa Honors Society* May 2020 - Present  
Geological Society of America 2020 Best Student Poster Presentation Award November 2020  
High Honors in Anthropology for thesis “Worlds Apart” May 2020  
Peirce Price for Excellence in Biology, Chemistry and Earth & Environmental Sciences May 2020  
Freeman Asian Scholarship – four-year full-tuition (\$250,894) August 2016 - May 2020  
Dean’s List Spring 2020, 2017; Fall 2019, 2018  
Wesleyan Summer Experience Grant (\$4,000) Summer 2019  
Wesleyan College of the Environment Research Grant (\$4,400) Summer 2019  
Goffe Summer Research Fund (\$1,000) Summer 2019  
Wesleyan College of Integrative Sciences Summer Research Fellowship (\$4,000) Summer 2018

## PROFESSIONAL MEMBERSHIPS

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*Member, Geological Society of America (GSA)*

August 2020 – Present

*Member, Palaeontological Society*

August 2020 – Present

*Member, American Geophysical Union (AGU)*

September 2018 – September 2019

## SKILLS

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**Computer:** ImageJ, Python, Basic R, Adobe Creative Suite [Acrobat Pro, Photoshop, Indesign, Premiere], Artec Studio Professional, ArcGIS Pro, Microsoft Office [Excel, PowerPoint, Word]

**Laboratory:** Chloroform-phenol extraction, Nanodrop spectroscopy, Plant histology slide preparation, Clear-and-stain, PCR, HPLC, Protein purification and quantification, Endotoxin testing, MEGA, 3D-modelling, Sample and specimen imaging

**Language:** Native Chinese. Native-equivalent English. Basic Latin. Conversant Cantonese and Hokkien.

**Interests:** Stargazing, hiking, jewellery-making, tree-climbing, SCUBA diving, painting, calligraphy, and non-horticultural plant collection.

## REFERENCES

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### **Ellen Thomas, PhD**

Harold T. Stearns Professor of Integrative Sciences

Smith Curator of Paleontology of the Joe Webb Peoples

Museum of Natural History

University Professor in the College of Integrative Sciences

Research Professor, Earth and Environmental Sciences

*Wesleyan University*

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### **Ann C. Burke, PhD**

Professor of Biology

*Wesleyan University*

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860-685-3518

### **Suzanne O'Connell, PhD**

Professor of Earth and

Environmental Sciences

Professor of Integrative Sciences

*Wesleyan University*

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860-685-2262

### **Katherine Brunson, PhD**

Professor of Archaeology

Professor, East Asian Studies

*Wesleyan University*

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