

Travis J. A. Craddock, Ph.D.
Curriculum Vitae
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Institute for Neuro-Immune Medicine
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Google Scholar Metrics:	h-index: 19	Citations: 1029
Web of Science Metrics:	h-index: 14	Citations: 522
ResearchGate Metrics:	h-index: 18	Citations: 777

EDUCATION

- 2008-2012 **Ph.D. in Physics (Biophysics)**
University of Alberta, Department of Physics, Edmonton, Canada
Advisor: Jack Tuszynski
Dissertation: *The Physical Basis for a Nanoneuroscience of Memory*
- 2005-2008 **M.Sc. in Physics (Biophysics)**
University of Alberta, Department of Physics, Edmonton, Canada
Advisor: Jack Tuszynski
Thesis: *Information Processing Capabilities of Microtubules at Physiological Temperature*
- 1997-2002 **B.Sc. in Physics (Honors)**
University of Guelph, Department of Physics, Guelph, Canada

POSITIONS & EMPLOYMENT

- 2018-Present **Director**
Clinical Systems Biology Group, Institute for Neuro-Immune Medicine
Nova Southeastern University, Ft. Lauderdale, FL
- 2018-Present **Associate Professor**
Departments of Psychology & Neuroscience, Computer Science, and Clinical Immunology, Nova Southeastern University, Ft. Lauderdale, USA

- 2013-2017 **Associate Director**
Clinical Systems Biology Group, Institute for Neuro-Immune Medicine
Nova Southeastern University, Ft. Lauderdale, FL
- 2013-Present **Assistant Professor**
Departments of Psychology & Neuroscience, Computer Science, and Clinical
Immunology, Nova Southeastern University, Ft. Lauderdale, USA
- 2012-2013 **Post-Doctoral Research in Computational Systems Biology**
University of Alberta, Department of Medicine, Edmonton, Canada
Supervisor: Gordon Broderick

PUBLICATIONS

* - indicates supervised student or staff

1. Jeffrey, M. G.*, Kregel, M., Kibler, J., Zundel, C., Klimas, N. G., Sullivan, K., & **Craddock, T. J.** (2019). Neuropsychological Findings in Gulf War Illness: A Review. *Frontiers in Psychology, 10*, 2088.
2. Jeffrey, M. G.*, Nathanson, L., Aenlle, K., Barnes, Z. M., Baig, M.*, Broderick, G., ... & **Craddock, T. J.** (2019). Treatment avenues in myalgic encephalomyelitis/chronic fatigue syndrome: a split-gender pharmacogenomic study of gene-expression modules. *Clinical therapeutics, 41(5)*, 815-835.
3. Perez, M.*, Jaundoo, R.*, Hilton, K., Del Alamo, A., Gemayel, K.*, Klimas, N. G., **Craddock, T. J.** & Nathanson, L. (2019). Genetic Predisposition for Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: A Pilot Study. *Frontiers in pediatrics, 7*, 206.
4. Morris, M. C., Cooney, K. E., Sedghamiz, H., Abreu, M., Collado, F., Balbin, E. G., **Craddock, T. J.**, Klimas, N. G. & Fletcher, M. A. (2019). Leveraging prior knowledge of endocrine immune regulation in the therapeutically relevant phenotyping of women with chronic fatigue syndrome. *Clinical therapeutics, 41(4)*, 656-674.
5. Sedghamiz, H., Morris, M., Whitley, D., **Craddock, T. J.**, Pichichero, M., & Broderick, G. (2019). Computation of robust minimal intervention sets in multi-valued biological regulatory networks. *Frontiers in physiology, 10*, 241.
6. Sedghamiz, H., Morris, M., **Craddock, T. J.**, Whitley, D., & Broderick, G. (2019). Bio-ModelChecker: Using Bounded Constraint Satisfaction to Seamlessly Integrate Observed Behavior With Prior Knowledge of Biological Networks. *Frontiers in Bioengineering and Biotechnology, 7*, 48.
7. Richman, S., Morris, M. C., Broderick, G., **Craddock, T. J.**, Klimas, N. G., & Fletcher, M. A. (2019). Pharmaceutical interventions in chronic fatigue syndrome: a literature-based commentary. *Clinical therapeutics, 41(5)*, 798-805.
8. Celardo, G. L., Angeli, M., Kurian, P., & **Craddock, T. J. A.** (2018). *On the existence of superradiant excitonic states in microtubules*. *New Journal of Physics (in-press)*.
9. Jaundoo R*, Bohmann J, Gutierrez G, Klimas NG, Broderick G, Morris M, **Craddock TJA.** (2018) *Using a Consensus Docking Approach to Predict Adverse Drug Reactions in Combination Drug Therapies for Gulf War Illness.* *International journal of molecular sciences 19.11: 3355.*

10. **Craddock TJA**, Michalovicz LT, Kelly KA, Rice MA Jr.*, Miller DB, Klimas NG, Morris M, O'Callaghan JP, Broderick G. (2018) *A Logic Model of Neural-Glial Interaction Suggests Altered Homeostatic Regulation in the Perpetuation of Neuroinflammation*, Frontiers in Cellular Neuroscience 12, 336.
11. Sedghamiz, H., Morris, M., **Craddock, T. J.**, Whitley, D., & Broderick, G. (2018). *High-fidelity discrete modeling of the HPA axis: a study of regulatory plasticity in biology*. BMC systems biology, 12(1), 76.
12. Toole, J. T.*, Kurian, P., & **Craddock, T. J. A.** (2018). *Coherent Energy Transfer and the Potential Implications for Consciousness*. Journal of Cognitive Science, 19(2), 115-124.
13. Kurian, P., Capolupo, A., **Craddock, T. J. A.**, & Vitiello, G. (2018). Water-mediated correlations in DNA-enzyme interactions. Physics Letters A, 382(1), 33-43.
14. Kurian P, Obisesan TO, **Craddock TJA**. *The Effects of Oxidative Stress and Excited Species on Microtubules: A Potential Role for Ultraweak Photon Emission in Neurodegenerative Disease?* Journal of Photochemistry & Photobiology, B: Biology 175 109-124 (2017)
15. **Craddock TJA**, Kurian P, Preto J, Sahu K, Hameroff SR, Klobukowski M, Tuszynski JA. *Anesthetic Alterations of Collective Terahertz Oscillations in Tubulin Correlate with Clinical Potency: Implications for Anesthetic Action and Post-Operative Cognitive Dysfunction*. Scientific Reports 7: 9877 (2017)
16. Trivedi MS, Holger D, Bui AT, **Craddock TJA**, Tartar JL *Short-term sleep deprivation leads to decreased systemic redox metabolites and altered epigenetic status*. PLoS ONE 12(7): e0181978. (2017)
17. Montagnier L, Aïssa J, Capolupo A, **Craddock TJ**, Kurian P, Lavallee C, Polcari A, Romano P, Tedeschi A, Vitiello G. *Water Bridging Dynamics of Polymerase Chain Reaction in the Gauge Theory Paradigm of Quantum Fields*. Water 11;9(5):339 (2017).
18. Wilson CE*, Lopatkin AJ, **Craddock TJA**, Driscoll W, Eldakar O, Lopez J, Smith R. *Cooperation and competition shape ecological resistance during periodic spatial disturbance of engineered bacteria*. Scientific Reports 7: 440 (2017)
19. Barker T*, Russo SA, Barker G*, Rice MA*, Jeffrey MG*, Broderick G, **Craddock TJ**. *A case matched study examining the reliability of using IMPACT to assess effects of multiple concussions*. BMC Psychology 28;5(1):14. (2017)
20. Viena T*, Gobin CM*, Fins AI, **Craddock TJA**, Tartar A, Tartar JL. *A PER3 polymorphism interacts with sleep duration to influence transient mood states in women*. Journal of Circadian Rhythms, 14(1) (2016)
21. Friesen DE, **Craddock TJA**, Kalra AP, Tuszynski JA. *Biological wires, communication systems, and implications for disease*. Biosystems 127C: 14-27 (2015)
22. Tartar, J. L., Fins, A. I., Lopez, A., Sierra, L. A., Silverman, S. A., Thomas, S. V.*, & **Craddock, T. J.** *Sleep restriction and delayed sleep associate with psychological health and biomarkers of stress and inflammation in women*. Sleep Health 1(4):249-256 (2015)
23. **Craddock, T. J.**, Del Rosario, R. R., Rice, M.*, Zysman, J. P., Fletcher, M. A., Klimas, N. G., & Broderick, G. *Achieving Remission in Gulf War Illness: A Simulation-Based Approach to Treatment Design*. PloS one, 10(7). (2015)
24. **Craddock, T. J.**, Harvey, J. M., Nathanson, L., Barnes, Z. M., Klimas, N. G., Fletcher, M. A., & Broderick, G. *Using gene expression signatures to identify novel treatment strategies in gulf war illness*. BMC medical genomics, 8(1), 36. (2015)

25. **Craddock TJA**, Hameroff SR, Ayoub AT, Klobukowski M, Tuszynski JA. *Anesthetics Act in Quantum Channels in Brain Microtubules to Prevent Consciousness*. Curr Trend Med Chem 15(6):523-33 (2015)
26. Vashishtha, S., Broderick, G., **Craddock, T. J.**, Fletcher, M. A., & Klimas, N. *G.Infering Broad Regulatory Biology from Time Course Data: Have We Reached an Upper Bound under Constraints Typical of In Vivo Studies?*. PloS one, 10(5). (2015)
27. Mark Rice*, **Travis John Adrian Craddock**, Ryan del Rosario, Zach Barnes, Nancy G. Klimas, Mary Ann Fletcher, Joel Zysman, Gordon Broderick *Gulf War Illness: is There Lasting Damage to Endocrine-immune Circuitry?* Systems Biomedicine, 2(4), 80-89. (2015)
28. **Craddock TJA**, Priel A, Tuszynski JA. *Keeping Time: Could Quantum Beating in Microtubules be the Basis for the Neural Synchrony Related to Consciousness?* J Integr Neurosci 13(2): 293-311 (2014).
29. **Craddock TJA**, Friesen D, Mane, J, Hameroff S, Tuszynski J. *The Feasibility of Coherent Energy Transfer in Microtubules*. J Roy Soc Interface 11(100): 20140677 (2014)
30. Atayoub AT, **Craddock TJA**, Klobukowski M, Tuszynski J. *Analysis of the Strength of Interfacial Hydrogen Bonds between Tubulin Dimers Using Quantum Theory of Atoms in Molecules*. Biophys J 107(3): 740-750 (2014)
31. Hameroff SR, Tuszynski JA, **Craddock TJA**. *Quantum Effects in the Understanding of Consciousness*. J Inter Neurosci 13(2): 229-252 (2014)
32. **Craddock TJA**, Fritsch P, Rice MA Jr.*, del Rosario R, Miller DB, et al. *A Role for Homeostatic Drive in the Perpetuation of Complex Chronic Illness: Gulf War Illness and Chronic Fatigue Syndrome*, PLoS ONE 9(1): e84839 (2014)
33. Fritsch P, **Craddock TJA**, del Rosario R, Rice M, Smylie AL, Folcik V, de Vries G, Fletcher MA, Klimas N, Broderick G. *Succumbing to the Laws of Attraction: Exploring the Sometimes Pathogenic Versatility of Discrete Immune Logic*. Systems Biomedicine 1(3): 0-1 (2014)
34. Broderick G, **Craddock TJA**, *Systems biology of complex symptom profiles: Capturing interactivity across behavior, brain and immune regulation*, Brain Behav Immun 29: 1-8 (2013).
35. Saha AA, **Craddock TJA**, Tuszynski JA, *An investigation of the plausibility of stochastic resonance in tubulin dimers*, Biosystems 107(2): 81–87 (2012)
36. Tuszynski JA, **Craddock TJA**, Mane JY, Barakat KH, Tseng CY, et al., *Modeling the Yew Tree Tubulin and a Comparison of its Interaction with Paclitaxel to Human Tubulin*, Pharm Res 29:3007-3021 (2012).
37. **Craddock TJA**, St. George M, Freedman H, Barakat KH, Damaraju S, et al., *Computational Predictions of Volatile Anesthetic Interactions with the Microtubule Cytoskeleton: Implications for Side Effects of General Anesthesia*, PLoS ONE 7(6): e37251 (2012)
38. **Craddock TJA**, Tuszynski JA, Goldstein LE, Chopra D, Hameroff S, et al., *The Zinc Dyshomeostasis Hypothesis of Alzheimer's Disease*, PLoS ONE 7(3): e33552 (2012)
39. **Craddock TJA**, Tuszynski JA, Hameroff S, *Cytoskeletal signaling: Is synaptic memory encoded in microtubule lattices by CaMKII phosphorylation?*, PLoS Comp Biol 8(3): e10024212011 (2012)

40. **Craddock TJA**, Tuszynski JA, *Molecular Models of Information Processing at the Level of Individual Neurons*, J Syst Sci Eng 20(1): 15-31 (2012)
41. Hameroff S, **Craddock TJA**, Tuszynski J, “*Memory Bytes*” - *Molecular match for CaMKII phosphorylation encoding of microtubule lattices*, J Integr Neurosci 9: 253-267 (2010)
42. **Craddock TJA**, Tuszynski JA, Priel A, Freedman H, *Microtubule Ionic Conduction and its Implications for Higher Cognitive Functions*, J Integr Neurosci 9(2): 103-122 (2010)
43. Woolf NJ, **Craddock TJA**, Friesen DE, Tuszynski JA, *Neuropsychiatric Illness: A Case for Impaired Neuroplasticity and Possible Quantum Processing Derailment in Microtubules*, NeuroQuant 8(1): 13-28 (2010)
44. **Craddock TJA**, Tuszynski JA, *A Critical Assessment of the Information Processing Capabilities of Neuronal Microtubules Using Coherent Excitations*, J Biol Phys 36(1): 53-70 (2010)
45. **Craddock TJA**, Beauchemin C. Tuszynski JA, *Information processing mechanisms in microtubules at physiological temperature: Model predictions for experimental tests*, Biosystems 97(1): 28-34 (2009)
46. Tuszynski JA, **Craddock TJA**, Carpenter RJ, *Bioferroelectricity at the Nanoscale*, J Theor Comput Nanosci 5: 2022-2032 (2008)
47. **Craddock TJA**, Tuszynski JA, *On the Role of Microtubules in Cognitive Brain Functions*, NeuroQuant 5(1): 32-57 (2007)

Book Chapters

1. **Travis J.A. Craddock**, Philip Kurian, Jack A. Tuszynski, Stuart R. Hameroff. *Quantum Processes in Neurophotonic and the Origin of the Brain’s Spatiotemporal Hierarchy*. In Neurophotonic and Biomedical Spectroscopy (Robert Alfano, Lingyan Shi, eds.) (Elsevier, Amsterdam, 2018)
2. Toole JT*, Rice Jr MA*, **Craddock TJ**, Nierenberg B, Klimas NG, Fletcher MA, Zysman J, Morris M, Broderick G. *Breaking Away: The Role of Homeostatic Drive in Perpetuating Depression*. *Psychoneuroimmunology: Methods and Protocols Second Edition*. 2018:121.
3. Toole JT*, Rice Jr MA*, Cargill J, **Craddock TJ**, Nierenberg B, Klimas NG, Fletcher MA, Morris M, Zysman J, Broderick G. *Increasing Resilience to Traumatic Stress: Understanding the Protective Role of Well-Being*. *Psychoneuroimmunology: Methods and Protocols Second Edition*. 2018:87.
4. Argibay, N. G., Vazquez, E. M., Wilson, C. E.*, **Craddock, T. J.**, & Smith, R. P. (2017). *Synthetic Biology: From Gene Circuits to Novel Biological Tools*. *Nanotechnology in Biology and Medicine: Methods, Devices, and Applications*, 371.
5. **Travis J. A. Craddock**, Stuart R. Hameroff and Jack A. Tuszynski, *The ‘Quantum Underground’ : Where Life and Consciousness Originate*. in R. R. Poznanski, J. A. Tuszynski and T. E. Feinberg (eds.) Biophysics of Consciousness: A Foundational Approach (World Scientific, Singapore, 2016), Chapter 13.
6. Friesen DE, **Craddock TJA**, Tuszynski JA, *Cytoskeletal Electrostatic and Ionic Conduction Effects in the Cell*, in Cifra M, Scholkmann F (eds.) Fields of the Cell, (Research Signpost, 2015), Chapter 13.

7. **Craddock TJA**, Tuszynski JA, *From Nano to Neuro and Beyond: A presentation of the emerging physics of consciousness from the ground up.* in Chopra D (ed.) Brain, Mind, Cosmos: The Nature of Our Existence and the Universe (Amazon Digital Services, Inc., 2014)

Manuscripts In-Submission

1. Jeffrey M, Collado F, Kibler J, DeLucia C, Messer S, Klimas N, **Craddock TJA**. *Gulf War Illness and Post-Traumatic Stress: Impact on Health Outcomes.* Submitted to Journal of Traumatic Stress (submitted 30-Sep-2019)

GRANTS & FUNDING

Active

- 06/2019-05/2021 ***Understanding of light-based quantum processes in selected biomaterial from the brain, microtubules, and cells***
 Army Research Office – W911NF-19-1-0373-(74884-PH) (Alfano PI, CCNY/ Craddock Site PI, NSU)
 \$122,587 subaward
Role: Co-PI (NSU Site PI) (15% salary support)
- 10/2018-9/2023 ***The Gulf War Illness Clinical Trials and Interventions Consortium***
 Department of Defense – (Klimas PI)
 \$6,000,000
Role: Co-I (5% salary support starting 10/2019)
- 9/29/2018-9/30/2021 ***Using Periodic Spatial Disturbance to Manipulate Cooperation in Bacteria***
 Department of Defense – (Smith PI)
 \$537,000
Role: Co-PI (10% Salary Support)
- 10//2018-9//2022 ***Immunomodulation in GWI***
 Department of Defense – (Nathanson PI)
 \$700,000
Role: Co-I (3% Salary Support)
- 10/2017 – 9/2019 ***Genomic approach to find female-specific mechanisms of GWI pathobiology***
 Department of Defense - GW160116 (Nathanson PI)
 \$667,000
Role: Co-I (5% salary support)
- 09/2016 – 09/2019 ***Improving Diagnostics and Treatments for GWI Females by Accounting for the Effects of PTSD***
 Department of Defense - GW150199 (Craddock PI)
 \$500,000
Role: PI (20% salary support)

- 09/2016 – 09/2019 ***Disentangling the Effects of PTSD from GWI for Improved Diagnostics and Treatments***
 Department of Defense - GW150144 (Craddock PI)
 \$450,000
Role: PI (20% salary support)
- 10/2015 – 09/2018
 ext. 09/2019 ***High Fidelity Design of Multi-modal Restorative Interventions in Gulf War Illness***
 Department of Defense - GW140142 (Broderick PI/Craddock PI)
 \$810,000
Role: PI (transferred March 2017 – previously Co-I) (15% salary support)
- 09/2014 – 04/2018
 ext. 04/2019 ***Gender Differences in Myalgic Encephalomyelitis/Chronic Fatigue Syndrome***
 National Institutes of Health - R01 NS090200-01 (Fletcher PI)
 \$1,984,256
Role: Co-I (4.5% salary support)
- 09/2013 - 09/2017
 ext. 10/2019 ***Understanding Gulf War Illness: An Integrative Modeling Approach***
 Department of Defense - W81XWH-13-2-0085 (Morris PI)
 \$4,102,527
Role: Co-I (10% salary support)

Pending (awarded but awaiting start date)

- 09/2020-09/2022 ***Mild Traumatic Brain Injury Association with Gulf War Illness: Evaluation with Established Models***
 Department of Defense (O’Callaghan PI – CDC)
 \$699,503
Role: Co-I (NSU site PI)

Completed (Last 5 years)

- 10/2015 – 09/2018 ***Testing the Model: A Phase I/II Randomized Double Blind Placebo Control Trial of Therapeutics: Liposomal Glutathione and Curcumin***
 Department of Defense - GW140153P1 (Klimas PI)
 \$1,073,000
Role: Co-I (10% salary support)
- 01/2014 - 12/2014 ***Post-exertion malaise in CFS: A systems biology approach to understanding brain, inflammation and behavior interactions***
 The CFIDS Association of America via Univeristy of Wisconsin
 Subaward - 499K531 (Cooke PI)
 \$125,000
Role: Co-I (2% salary support)

06/2010 - 08/2014 ***Theory-driven Models for Correcting “Fight or Flight” Imbalance in Gulf War Illness***
 Department of Defense - W81XWH-10-1-0774 (Broderick PI)
 \$530,000
Role: Staff/Co-I (100% / 15% salary support)

INVITED TALKS

- 2019 *Metabolic biophotonics, coherent energy transfer and superradiant excitonic states in microtubules* (30 min. presentation) *The Science of Consciousness 2019*, Interlaken, Switzerland, June 25-29, 2019
- Identifying Genetic Predisposition, and Genomic Dysfunction of Immune system, Hormone and Metabolic Regulation in ME/CFS for Improved Diagnostics and Treatment Avenues* (30 min. presentation) Invest in ME Research, 9th Biomedical Research into ME Colloquium, London, United Kingdom, May 27-31, 2019
- Excitonic transport in tubulin tryptophan networks* (60 min. presentation) Bose-Einstein Condensation in Inorganic and Organic Matter Workshop, Luminy, Marseille, April 29-30, 2019
- From Gene Expression to Multisystem Regulation: Identifying Optimal Treatment Courses for Complex Chronic Illnesses* (30 min. presentation) Emerge Australia - ME/CFS Chronic Fatigue Syndrome, Geelong, Australia, March 12-15, 2019
- 2018 *Light-Based Quantum Processes in the Brain: Ultraweak Photon Emission, Coherent Energy Transfer, and Superradiance* (30 min. presentation) 2nd Workshop of Biological Mentality, Center for the Physics of Living Organisms, Michigan Technological University. Ann Arbor, MI, USA, September 24-26, 2018
- Complex Neuronal-Glial Interaction, Altered Homeostatic Regulation, and the Perpetuation of Chronic Neuroinflammation* (30 min. plenary presentation) Summer School on Brain and Gut Neuroscience: From Molecules to Mood Turin, Italy August 26-31, 2018
- Light based quantum processes in the brain* (30 min. plenary presentation) Summer School on Brain and Gut Neuroscience: From Molecules to Mood Turin, Italy August 26-31, 2018
- The Physical Basis for a Nano-neuroscience* (30 min. plenary presentation) Summer School on Brain and Gut Neuroscience: From Molecules to Mood Turin, Italy August 26-31, 2018

Small changes, big effects: How weak anesthetic alterations of protein motions can lead to large changes in consciousness (30 min. plenary presentation). Science of Consciousness 2018, Tucson, AZ, USA (April 2-7, 2018)

Introduction to Research Data Analysis Workshop (1.5 hr. lecture) Miami-Dade College STEM Ladder Workshops, Miami, FL, USA (March 16, 2018)

2017 *Leveraging polypharmacology and regulatory system dynamics to predict drug treatment courses for neuroinflammatory illnesses* (1 hour presentation) Grand Rounds Jacob School of Medicine and Biomedical Sciences, University at Buffalo State University of New York. Buffalo, NY, USA, November 20th, 2017

Quantum Effects of Oxidative Stress on Microtubules and its Role in Tauopathic Disease (45 min. presentation) Workshop of Biological Mentality, Center for the Physics of Living Organisms, Michigan Technological University. Ann Arbor, MI, USA, August 7-9, 2017

Introduction to Research Data Analysis Workshop (2 hr. lecture) Miami-Dade College STEM Ladder Workshops, Miami, FL, USA (July 10, 2017)

A Unitary Mechanism of Anesthesia?: Altering Collective Oscillations in Microtubules (30 min plenary presentation) The Science of Consciousness 2017, La Jolla, CA, USA (June 5-12, 2017)

Quantum oscillations in microtubules and the implications for the neural synchrony related to consciousness (30 min presentation) The Science of Consciousness 2017 Preconference Workshop: Quantum Brain Biology, La Jolla, CA, USA (June 5-12, 2017)

Quantum Effects of Oxidative Stress on Microtubules and its Role in Tauopathic Disease (30 min presentation) The Science of Consciousness 2017 Preconference Workshop: Resonance, Life and Consciousness, La Jolla, CA, USA (June 5-12, 2017)

2016 *Using gene expression signatures to identify novel treatment strategies in Gulf War* (30 min plenary presentation) 12th International Association of Chronic Fatigue Syndrome / Myalgic Encephalomyelitis Research and Clinical Conference, Fort Lauderdale, FL, USA (October 27-30, 2016)

Introduction to Research Data Analysis Workshop (2 hr. lecture) Miami-Dade College STEM Ladder Workshops, Miami, FL, USA (July 28, 2016)

A Systems Biology Approach to ME/CFS (20 min. plenary presentation) Biomedical Research into Myalgic Encephalomyelitis Colloquium 6, London, United Kingdom (June 2, 2016)

Ultraviolet Driving Mechanism of Self-Organization Within Living/Conscious Systems? (40 min. presentation) The Science of Consciousness Preconference Workshop: Quantum Biology - Nature of Life. Tucson, AZ, USA (April 25, 2016)

Potential Effects of Excited Species on Microtubules and their Role in Tauopathic Disease (30 min presentation) Precision Medicine: A Howard University Mathematical Biology Workshop. Washington, DC, USA (April 9, 2016)

Harnessing Multi-system Regulation to Identify Optimal Treatment Courses for Complex Chronic Illnesses (25 min presentation) Advancing Computational Biology at Howard University Conference. Washington, DC, USA (April 8, 2016)

2015 *Coherent Energy Transfer in Microtubule Tryptophan Lattices Coupled to a Noisy Environment* (30 min. presentation) Conference on Complex Systems 2015: Quantum Complexity Workshop. Tempe, AZ, USA (October 1, 2015)

Coherent Energy Transfer in Microtubule Tryptophan Lattices Coupled to a Noisy Environment (45 min presentation). Florida International University, Department of Physics Colloquium. Miami, FL, USA (September 25, 2015)

Mechanisms of quantum coherence in tubulin and microtubules & the possible relevance to anesthesia (30 minute plenary presentation). Towards a Science of Consciousness 2015. Helsinki, Finland (June 12, 2015)

Introduction to Research Data Analysis Workshop (2 hour lecture) Miami-Dade College STEM Ladder Workshop. Miami, FL, USA (July 28, 2015)

2014 *Keeping Time: Quantum Beating in Microtubules and its relation to Higher Cognitive Processes* (35 min. presentation), Towards a Science of Consciousness – Pre-conference Workshop: Microtubules and Quantum Biology, Tucson, AZ, USA (April 21, 2014)

2013 *A Physical Basis for a Nanoneuroscience of Memory and Consciousness* (40 min. plenary presentation) Towards a Science of Consciousness 2013. Agra, India (March 7, 2013)

2012 *Volatile Anesthetic Interaction with Tubulin* (40 min. presentation) Michigan Technological University Physics Colloquium, Houghton, MI, USA (October 18, 2012)

Coherent Energy Transfer: Photosynthesis to Consciousness (20 min. presentation) Towards a Science of Consciousness Pre-conference Workshop: Quantum Consciousness Update. Tucson, AZ, USA (April 10, 2012)

- 2011 *Coherent Energy Transfer: From Photosynthesis to Microtubules* (30 min. presentation), Quantum Biology Workshop, Towards a Science of Consciousness – Post-conference Workshop. Stockholm, Sweden (May 7, 2011)
- 2010 *Phosphorylation sites on tubulin: a molecular code for memory and consciousness?* (20 min. presentation) Towards a Science of Consciousness Pre-conference Workshop: Update on Microtubules and Quantum Biology – Part II. Tucson, AZ, USA (April 13, 2010)
- Cytoskeletal Putative Binding Sites of General Anesthetics* (40 min. presentation) Towards a Science of Consciousness Pre-conference Workshop: Update on Microtubules and Quantum Biology – Part I. Tucson, AZ, USA (April 12, 2010)

CONFERENCE ACTIVITY/PARTICIPATION

Presentations

- 2018 *Investigating van der Waals Collective Behavior in Proteins via Interaction with Polarizable Ligands*. American Physical Society March Meeting 2018, Los Angeles, CA, USA, (March 5-9, 2018)
- Oxidative species induced excitonic transport in biomolecular aromatic networks*. American Physical Society March Meeting 2018, Los Angeles, CA, USA, (March 5-9, 2018)
- 2017 *Effect of Anesthetics on London Dispersion Oscillation in Tubulin and its Implications for Post-Operative Cognitive Dysfunction* (poster) Quantum Effects in Biological Systems 2017 Jerusalem, Israel (March 26-30)
- 2015 *Fire in the head: exploring the role of homeostatic drive in the perpetuation of neuroinflammation and brain disorders*. (Poster) Miami Veterans Affairs Research Day, Miami, FL, USA (May 18, 2015)
- 2014 *The Feasibility of Quantum Coherent Effects in Microtubules and their Potential Role in Neuron Function* (20 min. presentation) Towards a Science of Consciousness 2014. Tucson, AZ, USA, (April 25, 2014)
- Getting Down to Detail: Exploring the Sometimes Pathogenic Versatility of Discrete Immune Logic* (Poster) International Association for Chronic Fatigue Syndrom/Myalgic Encephalomyelitis 2014 Conference. San Francisco, CA, USA (March 20-23, 2014)
- Succumbing to the Laws of Attraction: Gender Differences in Homeostatic Drive and the Perpetuation of Chronic Illness* (Poster) International Association for Chronic Fatigue Syndrom/Myalgic Encephalomyelitis 2014 Conference. San Francisco, CA, USA, (March 20-23, 2014)

- Fire in the Head: Exploring the Role of Homeostatic Drive in the Perpetuation of Neuroinflammation in Brain Disorders* (Poster) Miami 2014 Winter Symposium – Molecular Basis of Brain Disorders. Miami, FL, USA (January 26-29)
- 2012 *The Zinc Dyshomeostasis Hypothesis of Alzheimer's Disease* (Poster) Campus Alberta Neuroscience Symposium, Edmonton, AB, Canada (October 30, 2012)
- Chromophores, Quantum Coherence and Microtubules: A Theoretical Investigation of a Quantum Mechanism of Signal Propagation Along a Microtubule* (20 min. presentation) Towards a Science of Consciousness 2012, Tucson, AZ, USA (April 10, 2012)
- 2011 *Volatile anesthetic interactions with tubulin and coherent energy transfer* (20 min. presentation) Towards a Science of Consciousness 2011, Stockholm, Sweden (May 4, 2011)
- Quantum Mechanisms of Electronic Signal Propagation Along a Microtubule* (Poster) American Physical Society March Meeting 2011, Dallas, TX, USA, (March 21-25, 2011)
- 2010 *Probing for Functional sites of Consciousness with Anesthetics: The Role of the Cytoskeleton* (Poster) Association for the Scientific Study of Consciousness 14th Annual Meeting, Toronto, ON, Canada (June 24-27, 2010)
- The Effect of General Anesthetics on Intracellular Signaling via Cytoskeletal Ionic Conduction* (Poster) 8th International Conference on Mechanisms of Anesthesia, Toronto, ON Canada (June 15-18, 2010)
- 'Memory Bytes' – A Molecular Match for Activated CaMKII Encoding Microtubule Lattices* (20 min. presentation) Towards a Science of Consciousness 2010, Tucson, AZ, USA (April 12-17, 2010)
- 2009 *Computational Determination of Putative Binding Sites of Anesthetics to the Cytoskeleton* (Poster) 7th Canadian Computational Chemistry Conference, Halifax, NS, Canada (July 20-24, 2009)
- Cytoskeletal Putative Binding Sites of General Anesthetics* (20 min. presentation) at Chemical Biophysics Symposium 2009, Toronto, ON, Canada (April 24-26, 2009)
- 2007 *The Quantum Basis of Consciousness: Quantum Based Microtubule Cellular Automata at Physiological Temperature* (Poster) Towards a Science of Consciousness 2007, Budapest, Hungary (July 23-27, 2007)
- The Effect of Physiological Temperature on the Dynamics of Microtubules* (25 min. presentation) Quantum Mind 2007, Salzburg, Austria, (July 17-21 2007)

2006 *Cellular Automata Model of a Microtubule using a Double Potential Well Found in Tubulin* (Poster) Towards a Science of Consciousness 2006, Tucson, AZ, USA, (April 2006)

CAMPUS & DEPARTMENTAL TALKS

- 2018 *Quantum Consciousness* (1 hour guest lecture) NEUR 2500 - Introduction to Neuroscience at Nova Southeastern University, Ft. Lauderdale, FL, USA, (October 17, 2017)
- Harnessing Altered Homeostatic Regulation, Complex Neuronal-Glial Interaction, and the Perpetuation of Chronic Neuroinflammation in Gulf War Illness to Design Novel Treatment Strategies* (1 hour lecture) NSU College of Pharmacy Graduate Seminar, Ft. Lauderdale, FL, USA (October 12, 2018)
- Introduction to Computational Biology & Bioinformatics* (1 hour lecture/tutorial) NSU Dillard High School Computer Science Summer Camp, Ft. Lauderdale, FL, USA (June 14, 2018)
- 2017 *Introduction to Computational Neuroscience* (2 hour lecture) Behavioral Neuroscience Summer Camp at Nova Southeastern University, Ft. Lauderdale, FL, USA (July 31, 2017)
- Effects of Oxidative Stress on Microtubules and its Role in Tauopathic Disease* (1 hour presentation) Nova Southeastern University's Institute for Neuro-Immune Medicine Lecture Series. Ft. Lauderdale, Florida, USA (May 5, 2017)
- Harnessing Multi-system Regulation to Identify Optimal Treatment Courses for Complex Chronic Illnesses* (25 min presentation) Translational Medicine, Engineering, and Computing (Trans-MEC) Research Symposium at Nova Southeastern University. Ft. Lauderdale, FL, USA (March 9, 2017)
- Quantum Consciousness* (1 hour guest lecture). PSYCH 2100 Biological Basis of Behavior at Nova Southeastern University, Ft. Lauderdale, FL, USA, (February 14, 2017)
- 2016 *Introduction to Computational Neuroscience* (2 hour lecture) Behavioral Neuroscience Summer Camp at Nova Southeastern University, Ft. Lauderdale, FL, USA (July 18, 2016)
- 2015 *Quantum Consciousness* (1 hour guest lecture). NEUR 2500 Introduction to Neuroscience at Nova Southeastern University, Ft. Lauderdale, FL, USA, (November 24, 2015)

That's Logical: Towards an Integrative Model of Neuro-Endocrine Immune Interaction (1 hour presentation) Nova Southeastern University's Institute for Neuro-Immune Medicine Lecture Series. Ft. Lauderdale, Florida, USA (March 6, 2015)

Virtual You: Modelling the Role of Homeostatic Drive in the Perpetuation of Chronic Illness (15 min presentation) Nova Southeastern University's Institute for Neuro-Immune Medicine Patient Conference 2015: Cellular Energy and Its Impact on Health. Ft. Lauderdale, Florida, USA (February 7, 2015)

2013 *Introduction to Quantum Consciousness – Part 2* (1 hr. presentation) The Neuroscience Journal Seminar Series at Nova Southeastern University, Ft. Lauderdale, Florida, USA (November 20, 2013)

Introduction to Quantum Consciousness – Part 1 (1 hr. presentation) The Neuroscience Journal Seminar Series at Nova Southeastern University, Ft. Lauderdale, Florida, USA (October 16, 2013)

Computational Systems Biology: Crossing Boundaries (40 min. presentation) Graduate School of Computer and Information Sciences Meeting at Nova Southeastern University, Ft. Lauderdale, Florida, USA (October 15, 2013)

A Role for Homeostatic Drive in the Perpetuation of Complex Chronic Illness (40 min. presentation) The MathBio Seminar Series at the University of Alberta, Edmonton, AB, Canada, (February 4, 2013)

Towards an Integrative Model of Gulf War Illness (40 min. presentation) Institute of Neuro-Immune Medicine Seminar at Nova Southeastern University, Fort Lauderdale, USA, (January 28, 2013)

2012 *Volatile Anesthetic Interaction with Tubulin* (45 min. presentation) University of Alberta Condensed Matter Physics Seminar, Edmonton, AB, Canada, (February 2, 2012)

MEDIA COVERAGE

2015 *Are the Androids Dreaming Yet?*, J. Tagg, Hurst Farm Books

2014 *Bridging the blood-brain barrier*, V. Wolters, International Innovation 128

2012 *Consciousness, Biology and Fundamental Physics*, S.Ragget, AuthorHouse

2012 *New Theories for origins of Alzheimer's*, A. McIlroy, Globe and Mail

2012 *The Molecular Architecture of Memory*, F. Brynie, Psychology Today

2012 *The "beans" in motion that preserve the memories* (Translation), M.P. Palimarini, Corriere della Sera

TEACHING EXPERIENCE

2013-Present Assistant/Associate Professor

Department of Psychology & Neuroscience, Nova Southeastern University, Ft. Lauderdale, USA

- *Introduction to Computational and Theoretical Neuroscience*
- *Graduate Certificate in Computational Molecular Biology*
- *Senior Seminar in Behavioral Neuroscience*
- *Independent Study in Behavioral Neuroscience*
- *Independent Study in Biology*
- *Independent Study in Chemistry*

2010-2013 Term Instructor

Department of Engineering, Grant MacEwan University, Edmonton, Canada

- *Engineering Mechanics - Statics*
- *Engineering Mechanics - Dynamics*

2009 Sessional Instructor

Department of Science, University of Alberta – Augustana Campus, Camrose, Canada

- *Mechanics*

2006-2013 Instructor

Math and Applied Science Centre (MASC), University of Alberta, Edmonton, Canada

- *Particles and Waves*
- *Waves, Motion Optics and Sound*
- *Newtonian Mechanics and Relativity*
- *Electricity and Magnetism*
- *Engineering Dynamics*

2005-2012 Teaching Assistant

Department of Physics, University of Alberta, Edmonton, Canada

- *Particles and Waves*
- *Waves, Motion Optics and Sound*
- *Newtonian Mechanics and Relativity*
- *Fluids and Waves*
- *Electricity and Magnetism*

2002-2004 Teaching Assistant

Department of Physics, University of Guelph, Ontario, Canada

- An Introduction to Mechanics
- Introductory Electricity and Magnetism
- Introductory Physics

ADVISING

Postdoctoral

2016-2017 Philip Kurian, College of Medicine, Howard University (Co-supervised with Dr. Thomas Obisesan)

PhD

2015-2019 Mary Jeffrey, Ph.D. College of Psychology, Nova Southeastern University
 2014-2019 Tory Toole, Ph.D. College of Psychology, Nova Southeastern University
 2014-2016 Trevor Barker, Psy.D. College of Psychology, Nova Southeastern University
 2014-2016 Gaytri Patel, Psy.D. College of Psychology, Nova Southeastern University

MSc

2019-Pres. Katarzyna Wojnas, M.Sc., College of Psychology, Nova Southeastern University
 2019-Pres. Anupriya Khare, M.Sc. College of Computing and Engineering, Nova Southeastern University
 2018-Pres. Rajeev Jaundoo, M.Sc. Department of Biomedical Engineering, University of Alberta (Co-Supervised with Dr. Jack Tuszynski)

Undergraduate

2019-Pres. Victoria Wyma, Behavioral Neuroscience, Nova Southeastern University
 2019-Pres. Rishabh Kasarla, Biology, Nova Southeastern University
 2019-Pres. Jeylen Garcia, Behavioral Neuroscience, Nova Southeastern University
 2018-Pres. Jacob Hardy, Behavioral Neuroscience, Nova Southeastern University
 2018 Jonathan Rub, Computer Science, Duke (summer volunteer)
 2018 Anthony Sangermano, Chemistry, Nova Southeastern University
 2017 Teresa Ju, Neuroscience, Duke (summer volunteer)
 2015, 2018 Francisco Carrera Arias, Behavioral Neuroscience, Nova Southeastern University
 2015-2018 Rajeev Jaundoo, Behavioral Neuroscience, Nova Southeastern University

High School

2019 Martin Luther Winn

Staff

2017-2019 Ricardo Castellanos, Research Programmer
 2015 Patrick Gourdet, Research Programmer
 2013-2015 Mark Rice, Jr. , Research Programmer
 2013-2015 Ryan Del Rosario, Research Programmer

OTHER RESEARCH EXPERIENCE

2002-2004 **Research Assistant**
 Department of Physics, University of Guelph, Ontario, Canada
 Supervisor: Gabriel Karl
 Project: Transition from the Sudden to the Adiabatic Approximation in β -Decay

PEER REVIEW ACTIVITY

Grant Application Review

2015 American Chemical Society, Petroleum Research Fund (1 application)

Ad-hoc Peer Reviewer for Journals

2019 Neuroscience Letters (1 manuscript)
 2018 Computational Biology and Chemistry (1 manuscript)
 2018 Physica A (1 manuscript)
 2018 Fatigue (1 manuscript)
 2017-2019 Medical Hypotheses (3 manuscripts)
 2017 Journal of Consciousness Studies (1 manuscript)
 2017 Brain, Behavior and Immunity (1 manuscript)
 2016-17,2019 Biosystems (3 manuscripts)
 2016 Langmuir (1 manuscript)
 2016 Cognitive Systems Research (1 manuscript)
 2016 Journal of Pharmacy and Pharmacology (1 manuscript)
 2016, 2018 Scientific Reports (2 manuscripts)
 2015-2016 Theoretical Biology and Medical Modeling (4 manuscripts)
 2015 Psychoneuroendocrinology (1 manuscript)
 2015 Frontiers in Psychology (1 manuscript)
 2015 Military Medical Research (1 manuscript)
 2015 Consciousness Research (1 manuscript)
 2014 Frontiers in Integrative Neuroscience (1 manuscript)
 2014 Physical Review E (1 manuscript)
 2014 IEEE Transactions of NanoBioscience (1 manuscript)
 2012-2014 BMC Systems Biology (7 manuscripts)
 2013 Journal of Chemical and Information Modeling (1 manuscript)

DEPARTMENTAL/UNIVERSITY/ADVISORY SERVICE

2017-2019 NIH-VA GWI Deep Phenotyping Study: Workgroup
 2017-2018 Department of Veterans Affairs, Gulf War Research Strategic Plan, Systems
 Biology and Biological Circuits Committee
 2015-Present Behavioral Neuroscience Curriculum Committee
 2013-Present GWIRP Consortium Publication Committee Member at NSU

PROFESSIONAL MEMBERSHIPS

2018-Present International Association for Chronic Fatigue Syndrome
 2017-Present Scientific Advisory Board Member, The Penrose Institute
 2017-Present American Physical Society, Member
 2017-Present Affiliate Member, Center for Computational Sciences, University of Miami
 2015-Present Complex Systems Society