

## Post PQE 2022

### Workshop on Quantum Mechanics, Biology, and Gravity

IQSE Seminar Room (MPHY 578), Texas A&M University, College Station, TX

**Zoom Info:** <https://tamu.zoom.us/j/8192969939?pwd=L2tET2tEeU54YXNHelY2VVZWdnEzdz09>

**Meeting ID: 819 296 9939, Pass code: 297578**

**Tuesday 1/18/2022**

**Chair: Marlan Scully/Philip Hemmer**

#### Biophotonics

Time	Speaker	Title
8:30-8:55	Breakfast	
8:55-9:00	Marlan Scully	Opening Remarks
9:00-9:20	Alexei Sokolov	Coherent vibrational spectroscopy as a tool for Biophotonics
9:20-9:40	Olga Kocharovskaya	Towards a resonant addressing of the ultranarrow nuclear resonances
9:40-10:00	Goong Chen	Special modes of motion by a coronavirus
10:00-10:30	Coffee Break	
10:30-10:50	Alexey Akimov	Gyroscope based on NV center in Diamond
10:50-11:50	Poster Session	

**Lunch (Jason's Deli) to be served between 11:50 to 13:00.**

**Tuesday 1/18/2022**

**Chair: Girish Agrawal**

#### Quantum Foundation, Quantum Information, and Cavity QED

Time	Speaker	Title
13:00-13:20	Luiz Davidovich	Quantifying quantum amplification
13:20-13:40	Alexey Belyanin	Strong coupling and quantum entanglement at the nonlinear parametric resonance in cavity QED
13:40-14:00	Vitaly Kocharovskiy	Quantum supremacy of an atomic boson sampling from an interacting BEC gas confined in a multi-qubit trap
14:00-14:30	Coffee Break	
14:30-14:50	Ronald Allen	Origin of the Bekenstein-Hawking entropy, Einstein-Hilbert action, and a dark matter candidate that should be detected in the next 2-5 years
14:50-15:10	Barnabas Kim	Single Atom in Cavity as Heat Engine
15:10-15:30	Yusef Maleki	From Optimal Speedup to Ultimate Sensors: A Universal Framework

Wednesday 1/19/2022

Chair: Alexei Sokolov

**Nonlinear Optics, Spectroscopy, and Low Temperature Physics**

Time	Speaker	Title
8:30-9:00	Breakfast	
9:00-9:20	Aart Verhoef	Advanced Optical Imaging Techniques for Plant Science
9:20-9:40	Anton Classen	Idea for quantum-enhanced super-resolution two-photon microscopy via structured illumination and intensity auto-correlations, along with quantum illumination
9:40-10:00	Vladimir Khmelenko	Spatial quantum diffusion of hydrogen atoms in solid molecular hydrogen at temperatures below 1K
10:00-10:20	Zhenhuan Yi	Towards Tip-enhanced Low Frequency Raman
10:20-10:50	Coffee Break	
10:50-11:10	Aleksei Zheltikov	Laser-driven microwave antennas and cross-range nonlinear optics
11:10-11:30	Vladislav Yakovlev	Brillouin spectroscopy and microscopy
11:30-12:00	Zhenrong Zhang Baylor University	Plasmonic fiber probes for nanoscale chemical imaging and thermal imaging

Lunch (Jason's Deli) to be served between 12:00 to 12:40.

Wednesday 1/19/2022

Chair: Barnabas Kim/Zhenhuan Yi

**Quantum Field theory in Curved Space-Time, Unruh Radiation, and Gravity**

Time	Speaker	Title
12:40-13:00	Stephen Fulling	Once More unto the Breach for the Equivalence Principle for Uniform Acceleration Radiation
13:00-13:10	Anatoly Svidzinsky	Unruh and Cherenkov radiation from a negative frequency perspective and generation of entangled photon pairs
13:10-13:20	Jonathan Ben-Benjamin	The quantum optics view of the Hawking's Hawking radiation cartoon
13:20-13:30	Arash Azizi	Two Unruh-Minkowski photon emission
13:30-14:00	Coffee Break	
14:00-14:30	Denys Bondar Tulane University	Decoherence-free entropic gravity: Model and experimental tests
14:30-15:00	Gary Rozenman Tel Aviv University	Quantum and Optical Phenomena in Surface Gravity Waves

**THE CHANCELLOR SHARP DISTINGUISHED LECTURE SERIES IN CONJUNCTION WITH IQSE AND THE HAGLER INSTITUTE PRESENTS:**

**Prof. Luiz Davidovich** "Science Diplomacy in the World Today"

16:00-17:00 Wednesday 1/19/2022 in Hawking Auditorium, MIST. (Note: Reception will be held on the first floor, MIST at 15:30-16:00).