

**Yearly report for the Elizabeth and Richard Henes Center for Quantum Phenomena
(CQP) for academic year 2019-2020**

Externally funded research projects through CQP, brought combined \$211,200 in Facilities and Administrative charges during Fiscal Year 2020. Henes Center received 18% of it, or approximately \$38,000. The active research projects are:

- (1) Miguel Levy, "Phase II SBIR: "Materials Processing for Heterogeneous Integration of Optical Isolators", US Air Force.
- (2) Ramy El-Ganainy, "Wave Mixing", the National Science Foundation.
- (3) Ramy El-Ganany, "Supersymmetry in Optics and Photonics", DoD, Army Research Office
- (4) Ravi Pandey, "First Principles Studies of Structure-Property Relationships in Two-Dimensional Nanomaterials Beyond Graphene for Defense Applications", US Army.
- (5) Dongyan Zhang, "High Brightness Fluorophores II", Stabilux Biosciences and NSF.
- (6) Dongyan Zhang, "Synthesis and Characterization of High Brightness Fluorophores", Stabilux Biosciences.
- (7) Elena Giusarma, "Simulation the Large-Scale Structure of the Universe with Convolutional Neural Networks", NASA Research Seed Grant from Michigan Space Grant Consortium (MSGC)

CQP's sponsored activities in academic year 2019-2020:

- (1) New Research Initiative with objective to explore novel techniques in computational electromagnetics (\$1,803)
- (2) Domestic travel:
 - (a) Experiments on sites outside MTU at Argonne National Laboratory (\$1,022)
 - (b) Collaboration with Lawrence Livermore Laboratory in California (\$2,000)
- (3) Foreign travel:

India, to organize the International Workshop on Modelling of Materials (\$1,778).
- (4) Computers and software dedicated to research activities (\$2,486).
- (5) Honorarium:

Prof. Massimo Moraldi, University of Florence, Italy. Lectures series on Raman Spectroscopy held at Michigan Tech in October of 2019 (\$2,000).
- (6) Cost share:

Mandatory matching for NASA Research Seed Grant from Michigan Space Grant Consortium (MSGC) (\$5,000)
- (7) Total expenditures for the year -\$16,090
- (8) Total revenue \$38,010
- (9) Carryover from previous year \$28,659

Balance on July 01 2020

\$50.579