Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Coupling effects in the modal emission of colloidal quantum dot microdisk lasers.**[1] EVAN LAFALCE, QINGJI ZHENG, Univ of Utah, CHUNHAO LIN, MARCUS SMITH, SIDNEY MALAK, JAEHAN JUNG, YOUNG YOON, ZHIQUN LIN, VLADIMIR TSUKRUK, Georgia Tech University, Z. VALY VARDENY, Univ of Utah — Solution-processed semiconductors such as colloidal quantum dots (CQD) are particularly suited materials for monolithic fabrication of laser microstructures because of their ease of fabrication and compatibility with conventional lithographic techniques. We use the functionality of core/alloyed-shell CQDs to fabricate microdisk lasers of variable size and study the resulting whispering-gallery mode laser emission. In particular we study the effects of near-field coupling on resonant modes of pairs of these lasers with sub-micrometer spacing. We demonstrate the occurrence of lasing modes that originate from the interaction between two such microdisks by means of varying the spatial distribution and magnitude of the gain and loss in the coupled-pair. The transition from emission of modes localized on a single disk to those of the interacting pair is accompanied by coalescence of eigen-frequencies and pump-induced turn-off of lasing, highlighting the role of parity-time symmetry and exceptional point physics.

[1]This work was funded by AFOSR through MURI grant RA 9550-14-1-0037.

Evan Lafalce
Univ of Utah

Date submitted: 08 Nov 2016 Electronic form version 1.4