

# YONSEI

## BK Geometry Seminar

### Lagrangian Multi-sections and their Toric Equivariant Mirror

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The SYZ conjecture suggests a folklore that "Lagrangian multi-sections are mirror to holomorphic vector bundles". In this paper, we prove this folklore for Lagrangian multi-sections inside cotangent bundle of vector spaces, which are equivariantly mirror to complete toric varieties by the work of Fang-Liu-Treumann-Zaslow. We also introduce the Lagrangian realization problem, which asks whether one can construct an unobstructed Lagrangian multi-section with asymptotic condition prescribed by a tropical Lagrangian multi-section. We solve the realization problem for 2-fold tropical Lagrangian multi-sections over a complete 2-dimensional fan that satisfy the so called alternating slope condition. As an application, we show that every rank 2 toric vector bundle on the projective plane is mirror to a Lagrangian multi-section.

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