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## KIDSpec – an MKID based medium resolution, integral field spectrograph

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KIDSPec, the Kinetic Inductance Detector Spectrograph, is a novel concept for a highly sensitive, medium spectral resolution optical through near-IR spectrograph. It uses the intrinsic energy resolving capability of an array of optical/IR-sensitive MKIDs to distinguish multiple orders from a low-resolution grating. By acting as an 'order resolver', the MKID array replaces the cross-disperser in an echelle spectrograph. This greatly simplifies the optical layout of the spectrograph and enables longer slits than are possible with cross-dispersed instruments (to improve sky subtraction).

KIDSpec would have similar capabilities to ESO's highly successful X-shooter instrument. It would provide an R=4000-10,000 spectrum covering the optical and near-IR spectral range (0.4-1.5 micrometers). As well as a 'long-slit'mode, the IFU would provide a small (~50 spaxel) field-of-view for spatially resolved sources. In addition, the photon-counting operation of MKIDs and their photon-energy resolving ability enable a readnoise free spectrum with perfect cosmic ray removal. The spectral resolution would be sufficient to remove the bright night-sky lines without the additional pixel noise, making the instrument more sensitive than an equivalent semiconductor-based instrument.

KIDSpec would enhance many existing high-profile science cases, including transient (GRB, SNe, etc.) followup, redshift determination of faint objects and transit spectroscopy of exoplanets. In addition it will enable unique science cases, such as dynamical mass estimates of the compact objects in ultra-compact binaries.

## Less than 5 years of experience since completion of Ph.D

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## Student (Ph.D., M.Sc. or B.Sc.)

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