

Institute for Theory and Computation Future Directions

The ITC serves as a center of excellence that currently hosts a group of 25-30 top-quality postdocs, 30-40 graduate students from the Astronomy and Physics departments at Harvard, and 150 outside visitors every year. It also serves the very important role of fostering interaction between observers and theorists within the CfA.

The diverse research activities within the ITC stimulate new observational projects at Harvard and provide analysis and theoretical interpretation of data as soon as these projects mature. A few recent examples of this successful role of the ITC include (i) the theoretical foundation of 21-cm cosmology in the ITC corridor, which led to Harvard's participation in the MWA project; (ii) the predicted silhouette structure of black holes which guided mm-VLBI imaging of SgrA* and M87; (iii) the predicted properties of the first stars and galaxies, which provided important motivation for JWST and the GMT; and (iv) the theoretical modeling of the emission spectrum of accretion disks, which enabled a new census of black hole spins in the local Universe.

It is imperative that the ITC will continue to stimulate and serve new observational initiatives in the Harvard College Observatory. In the coming decade, those initiatives will likely include: (i) transient surveys such as Pan-STARRS, LSST and WFIRST; (ii) studies of the first galaxies and planetary systems by JWST and the GMT; (iii) microlensing searches for planets with WFIRST.

Competing institutions (such as IAS and CITA) offer 5-year postdoctoral fellowships to the very best postdocs in the job market. In order for the ITC to remain competitive, it is essential that ITC funding will be secured for the long-term future. A permanent endowment will ensure that the ITC's prominence in theoretical astrophysics will continue in perpetuity.

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and Computation*