

Subaru Strategic Exploration of Exoplanets and Disks with HiCIAO/AO188 (SEEDS): Proposal

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<http://optik2.mtk.nao.ac.jp/~hide/index.html>

Since the first detection of exoplanets orbiting normal stars in 1995, many exciting discoveries have been made, but our understanding of planetary systems and their formation is far from complete. A census of companions to stars over a wide range of ages will provide important clues to the formation and evolution of stars, brown dwarfs, and planets.

Armed with a much better performance than that of the CIAO-AO36 combination, we propose to conduct a Subaru-HiCIAO-AO188 imaging survey as a Subaru Strategic Observation, searching for giant planets (1-13 MJ masses) and protoplanetary/debris disks mainly around roughly 500 nearby solar-type or more massive young stars. The ages of our exoplanet target stars span 1-10 Myr for YSOs in nearest star forming regions, through 100-500 Myr old stars in nearby open clusters, to about 1 Gyr old nearby stars. Direct imaging is indispensable for the detection of such young planets, especially planets in outer circumstellar regions (a few AU - 100 AU), complementary to radial velocity searches. The protoplanetary disk targets are the YSOs in nearby star forming regions.

The goals of our survey are to address the following key issues in exoplanet/disk science: (1) the detection and census of exoplanets in the outer circumstellar regions around solar-mass stars and massive stars, (2) the evolution of protoplanetary and debris disks including their morphological diversity, and (3) the link between exoplanets and circumstellar disks. The completeness and uniformity of this systematic survey will provide important statistical, or even useful null, results to be obtained as well as enabling the study of individual objects of particular interest. The SEEDS data set will be a dominant one in this important field of research for a period of many years.

In this talk, we will outline the proposal, emphasizing our target selection strategy and expected results. A full list of the proposers can be found on our web site.