

Characterization of Exoplanets with High Contrast Instruments

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Small exoplanets in the habitable zone (HZ) have been recently discovered by Kepler spacecraft and by ground-based radial velocity surveys. Now one of most interesting issues in this field is how to characterize them. In this presentation, I review our approaches to develop the instruments of direct imaging for the Thirty Meter Telescope (TMT) and other ground-based telescopes. These instruments aim to detect exoplanets in the HZ around late-type stars. I show that the search for the oxygen 1.27 micron bands as a biomarker is promising with the ground-based direct imaging (Kawahara+12 ApJ). I also show that the combination of extreme adaptive optics and coronagraphs for the direct imaging is also valuable for other characterization of exoplanets, for instance, for detection of exoplanetary molecules in close-in planets.

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