1. **Introduction**
   1. **Motivation in context to exoplanets (1-2 pages)**
      1. Landscape of exoplanet detections and diversity of systems

* *Systems with hot jupiters, outgassing planets, Tatooine systems*
  + *51 peg, HD 209458b, etc.*
* *How much is selection effect is uncertain*
* *And then there are systems that are architecturally familiar (Kepler multiplanet systems (Lissauer2014), HR 8799) and we wish to ask whether the overarching morphology can result in something similar to our own system. One thing HR 8799 and others have in common with us are their disks.*
  + 1. Open questions to look forward to:
       1. Understand diversity of planetary systems
       2. Within diversity, when can we find a potentially habitable system?
       3. How can we identify such systems?
    2. One place to look is the solar system where the presence of not just Earth but the rich interplay between the planets and the circumsolar disk of asteroids and comets has a wide impact on our evolution.
    3. Hence next question to ask is whether nature can mimic a similar architecture and how we fit into the context of the diverse detections

(Images: Separation vs. Mass plot of detected planets)

**This thesis goes a step in that direction by identifying systems which have been previously overlooked due to lack of technological advancement and which may be prime real-estate to search for earth like systems(?) rephrase.**

* 1. **The Solar System’s Debris Disk (1-3 pages)**
     1. Current structure of the disk (hand drawn illustration of the debris disk)
        1. Double belt system, sandwiching planets, zodiacal light

(Images: 1-d view of solar system, zodiacal light)

* + 1. Current configuration result of concurrent evolution
       1. LHB, zodiacal belt caused by comets breaking up due to Jupiter
* *Gomes+2005, Morbidelli+2000, Nesvorny+2011*
  + - 1. Belt responsible for conditions on Earth? (water transport, shield)
* *Martin and Livio2013, Bancelin+2015*
  + - 1. Signs that are observable from alien worlds
         1. Lious & Zook, Kuchner models

(Images: Liou & Zook or Kuchner model)

* 1. **Evolution of a Circumstellar Disk (3-5 pages)**
     1. Protoplanetary Disk Phase
        1. Gas rich disk formed from disk collapse (explain architecture)
        2. Dispersal of disk by photoevaporation, grain growth, planetismal clearing (~10 Myr)

(Image: Grain Growth Beckwith2000,

* + 1. Debris Disk Phase
       1. Characteristics of debris disks (gas poor, dust rich)
       2. Dust removal mechanisms and timescales (PR Drag, radiation pressure, stellar wind, etc.)
       3. Dust found around stars at different ages. Hence replenishment through collisions of planetismals
  1. **Debris Disk as Signpost for Planets**
     1. Types of collisions (stochastic and steady state)
     2. Unresolved and Resolved examples of planet disk interaction
     3. Warm dust as tracer for activity in HZ and terrestrial planet region
  2. **Layout of Dissertation.**

1. **Observations of Debris Disks**
   * 1. Unresolved identification via SED (mention differences between ppd SEDs)
     2. Thirty years of Disk Surveys (IRAS, Spitzer, ISO, Herschel)
        1. Disparity between number of warm and cold disks
     3. WISE Intro and Previous results from WISE