

The Roman-Kepler Legacy Survey

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**Kepler provided precise, high-cadence, long-duration light curves, plus
15 years of planetary and stellar astrophysics investigations.**

Roman will provide depth, spatial resolution, and astrometry.

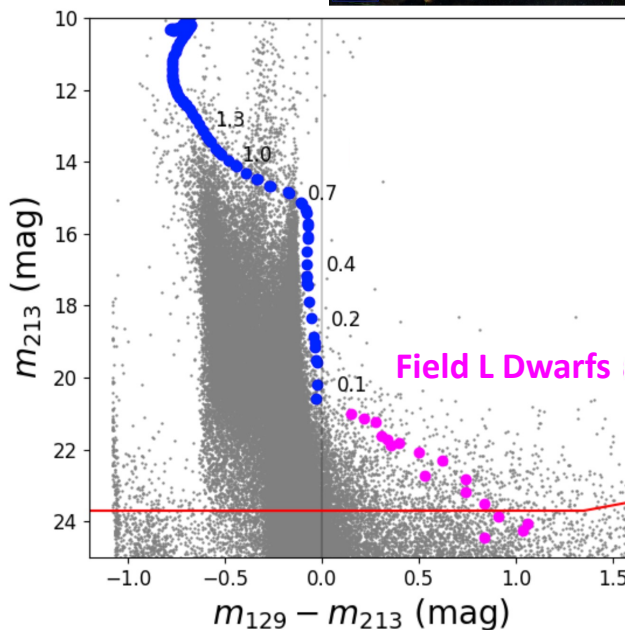
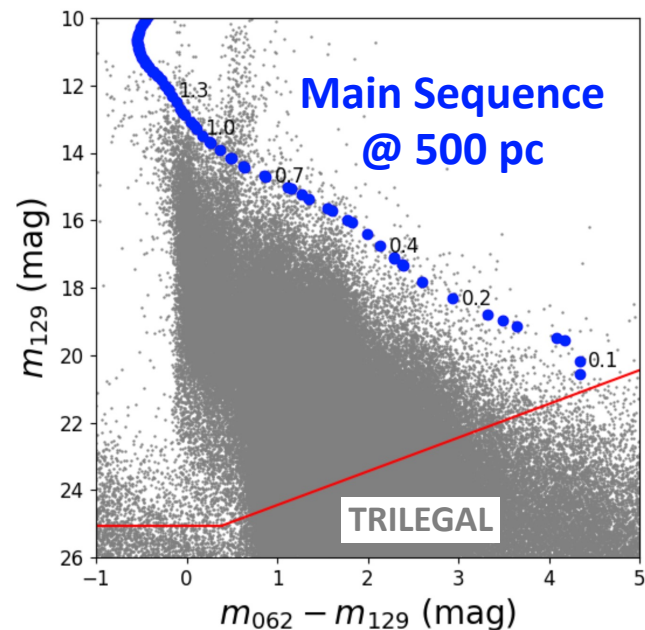
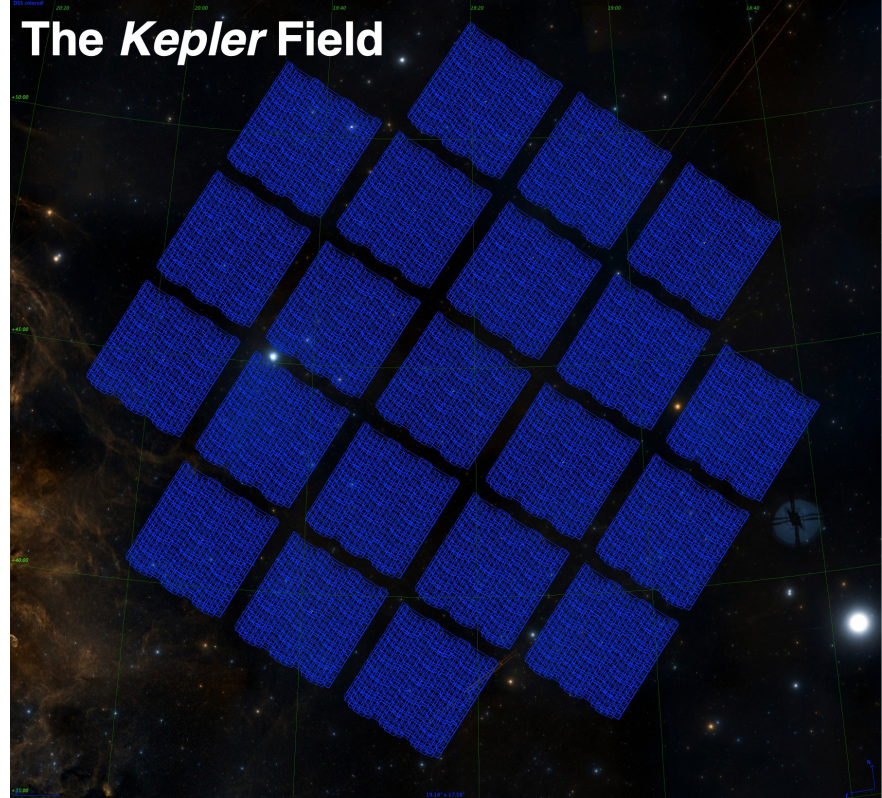
Survey Plan

378 WFI tiles = 97.1 deg²

$$+5 < b < +22$$

$$68 < l < 85$$

T_{int} = 4.5 minutes/filter



**Three Filters:
F062, F129, F213**

**Repeat F213
In Cycle 3**

Science Goals

- **Planetary Demographics in Binary Star Systems**
 - Impact of Binarity on Planets: Fewer? More? Different?
 - Control Sample of Non-Planet Hosts
 - Planet/Binary Orbit Alignment
- **Validating Kepler's Planets & Removing Astrophysical Systematics from Kepler Demographics**
 - Validating Kepler's Small & HZ Planets
 - Deblending Kepler's Non-Planet Hosts
 - Confirm False Positives, Rescue True Planets
- **Exploiting Kepler + Roman for Stellar Astrophysics**
 - Binary demographics in Thin Disk vs Thick Disk vs Halo
 - Benchmark Brown Dwarfs with Gyro-Aged Primaries
 - Validating EBs/Asteroseismology for Testing Stellar Models
- **MW Demographics Complementing The Core Surveys**

Key Data Products

- **Stage 1:**
 - Postage Stamps for Kepler Targets + Volume-Limited Sample
 - Source Catalogs
- **Stage 2:**
 - Companion Identification via PSF Fitting
 - Detection Limits on Companions
 - Color-Based Assessment of Binaries vs Background Stars
- **Stage 3:**
 - Updated Stellar Properties for KIC + Volume-Limited Sample
 - Gaia DR4 + Roman Epoch 1 Astrometric Catalog
- **Stage 4 (after Cycle 3):**
 - Gaia DR4 + All-Roman Astrometric Catalog