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Title: Glimpsing the Composition Distribution of Sub-Neptune-Size Exoplanets  
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Abstract: The Kepler Mission, combined with ground based RV follow-up and TTV dynamical analyses, has revolutionized the observational constraints on sub-Neptune-size planet compositions. We present an updated planet mass-radius diagram, including the 42 small Kepler transiting planet candidates with Keck RV-measured masses (or mass upper limits) unveiled by Marcy et al. in a companion presentation. From the observed planet mass-radius distribution, we theorize about why parts of the distribution are unpopulated and about whether this could be a signature of planet formation and evolution. We focus on the intriguing transition between rocky exoplanets (comprised of iron and silicates) and planets with voluminous layers of volatiles (H/He or astrophysical ices). Applying a hierarchical Bayesian model to the current sample of sub-Neptune-size KOIs with RV follow-up, we constrain how the fraction of planets that are dense enough to be rocky varies with planet radius. We find that most planets larger than 1.8 Earth-radii are not rocky.