The difficulty of forming Earth analogs J. Jennings[1], B. Ercolano[1,2], G. Rosotti[3], and T. Birnstiel[1] [1]University Observatory, Faculty of Physics, Ludwig-Maximilians-Universitaet Munchen, Scheinerstr. 1, 81679 Munich, Germany, [2]Excellence Cluster Origin and Structure of the Universe, Boltzmannstr. 2, 85748 Garching bei Munchen, Germany, [3]Institute of Astronomy, University of Cambridge, Madingley Road, Cambridge, UK.

Within the protoplanetary disc, the growth of dust grains to build planetesimals, km-size bodies that may subsequently coalesce into terrestrial planets (and giant planet cores), is known to be theoretically problematic. Throughout this process dust particles encounter a number of barriers that suggest growth is largely inefficient, yet the ubiquity of planets implies these obstacles are commonly overcome. One route to quickly cross multiple hurdles may be the trapping of dust particles in gas pressure maxima within the disc to trigger the streaming instability, which is able to catalyze the aggregation of dust on kyr timescales, bypassing the fragmentation and drift barriers to form planetesimals. However there remains a lack of consensus on the physical mechanism(s) predominantly responsible for initiating this instability. I will discuss one potential method, photoevaporative disc dispersal, wherein the preferential removal of relatively dust-free gas can increase the disc metallicity. Late in the gas disc lifetime, photoevaporation may dominate the disc's evolution and create a steep gradient in the depleted gas surface density where photoevaporative mass loss is concentrated; this induces a local pressure maximum that collects drifting dust particles, which may then be susceptible to the streaming instability. I will summarize our results using a one-dimensional viscous evolution model of a disc subject to internal X-ray and EUV photoevaporation to determine the efficacy of this process in building an Earth mass of planetestimals between 1 – 10 AU. Over a range of parameters for the dust and gas disc evolution and the photoevaporative intensity, we have found that only under quite liberal circumstances can the photoevaporation-induced streaming instability yield sufficient planetesimal concentrations to seed an Earth analog. Our results typically form much less than an Earth mass near 1 AU, and I will thus conclude by summarizing the physical scenarios required to realize planetesimal formation under our models and produce the seeds of terrestrial planets in the habitable zone of a low mass star.