SCHRÖDINGER BASIN: A GEOLOGICALLY DIVERSE LANDING AREA. K. O'Sullivan[1], T. Kohout[2 3 4], A, Losiak[5], D. Kring[6], K. Thaisen[7] and S. Weider[8, 9]. [1]Department of Civil Engineering and Geological Sciences, University of Notre Dame, Notre Dame, IN, USA. kosulli4@nd.edu, [2]Department of Physics, University of Helsinki, Finland, tomas.kohout@helsinki.fi, [3]Department of Applied Geophysics, Charles University in Prague, Czech Republic, [4]Institute of Geology, Academy of Sciences of the Czech Republic, Prague, Czech Republic, [5]Michigan State University, East Lansing, MI, USA, [6]Lunar and Planetary institute, Houston, TX, USA, [7]University of Tennessee, Knoxville, TN, USA, [8]The Joint UCL/Birkbeck Research School of Earth Sciences, London, UK, [9]The Rutherford Appleton Laboratory, Chilton, Oxfordshire, UK.

Introduction: The National Research Council's *The Scientific Context for Exploration of the Moon* report (NRC) outlines a set of prioritized objectives that should be accomplished with missions that return to the Moon [1]. The top priorities described by the NRC include dating basins and craters on the Moon in order to better understand the impact history of our solar system.

Schrödinger basin is the second youngest basin, therefore its absolute age would provide an important data point on the impact flux history curve. The basin also overlies two pre-Nectarian basins, South Pole Aitken (SPA) and Amundsen-Gainswindt (AG). SPA is the oldest known basin on the Moon, and accurately determining the age of the basin is the NRC's second highest priority. Schrödinger basin also presents a diverse and well-exposed set of geologically interesting features. Due to the location and geologic diversity of the basin, we feel that Schrödinger is an optimal landing site.

Geology: Schrödinger is located near the South Pole on the far side of the moon, and is approximately 300 km in diameter (figure 1). The inner peak ring is approximately 120 km in diameter and was created when materials underlying Schrödinger were uplifted just after impact [2]. Because Schrödinger is within the topographic rings of the SPA basin, SPA material could be uplifted and exposed as the inner peak ring of Schrödinger. The intersection of Schrödinger and AG basin is expressed as a set of landslides on the basin rim (figure 1), and AG materials could possibly outcrop in these areas.

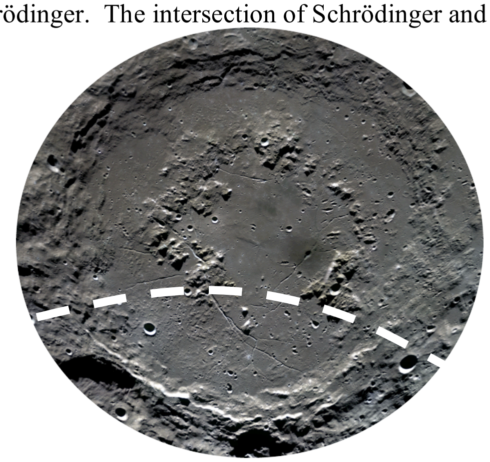

Figure 1: Schrödinger Basin. Dashed line indicates the rim of the Amundsen-Gainswindt basin.

Within the inner peak of Schrödinger are a variety of geologic features easily accessible for exploration. A pyroclastic volcano (dark albedo circular feature in figure 1) lies within the inner ring, and its material may have an upper mantle origin [3]. Several other volcanic outcrops occur within the inner peak ring, and are thought to have different origins than the pyroclastic volcano [3]. A number of fractures occur within the basin, and are thought to pre-date the basin formation [3]. These fractures can provide important information on the pre-existing structure of the Schrödinger area, as well as provide excellent outcrops at which to study the Schrödinger melt sheet. Many secondary craters are found within Schrödinger [3], and examining them may provide important insights into the processes that form them.

Conclusion: A Schrödinger landing site would provide opportunities to find, collect, and date Schrödinger, SPA, and AG impact material, providing key points on the impact flux curve. Additionally, various other accessible geologic features could address the NRC objectives (Table 1). Specific localities can be located and mapped with a precursor robotic mission as described in [3]. Due to the diversity of the basin, Schrödinger is an optimal landing site.

Table 1: Example of NRC objectives that can be addressed within Schrödinger basin.

Schrödinger impact material	1a, 1c, 3a, 3d, 6b
SPA impact material	1b, 3d, 6a
Date Amundsen-Gainswindt impact	1a, 1c, 3d
Various volcanic events	1d, 3a, 3d, 5a,b,c

*see [1] for numbering and further explanation of goals

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References: [1] National Research Council, *The Scientific Context for Exploration of the Moon* (2007). [2] Cintala M. J. and Grieve R. A. (1998) MAPS, 33, 889-912. [3] Shoemaker E. M. et al. (1994) *Science, 266,* 1851–1854. [4] Kohout et al. (this volume).