EXPLORING KEY LUNAR STRATIGRAPHIC UNITS REPRESENTING 4 BILLION YEARS OF LUNAR HISTORY WITHIN SCHRÖDINGER BASIN. T. Kohout[1, 2], K. O'Sullivan[3], K. G. Thaisen[4] and D. A. Kring[5], [1]Department of Physics, University of Helsinki, Finland, tomas.kohout@helsinki.fi, [2]Institute of Geology, Academy of Sciences of the Czech Republic, Prague, Czech Republic, [3]Department of Civil Engineering and Geological Sciences, University of Notre Dame, Notre Dame, IN, USA kosulli4@nd.edu, [4]University of Tennessee, Knoxville, TN, USA, [5]Lunar and Planetary institute, Houston, TX, USA.

Introduction: To test the lunar cataclysm hypothesis and anchor the beginning of the basin-forming epoch on the Moon, we evaluated potential landing sites within the Schrödinger Basin [1]. This impact site is the second youngest basin-forming event and lies within the South Pole-Aitken Basin (SPA), which is the oldest and largest impact basin on the Moon. Thus, landing sites within Schrödinger should provide access to impact lithologies with ages of each event, providing a bracket of the entire basin-forming epoch and resolving both of the leading science priorities [2]. Additionally, the floor of Schrödinger Basin has been partially covered by younger mare and pyroclastic units. The volcanic materials, as well as impact-excavated and uplifted units, will provide chemical and lithologic samples of the lunar crust and potentially the upper mantle. Collectively, the impact and volcanic lithologies will provide calibration points to the entire lunar stratigraphic column.

Landing site selection: We propose a landing site for manned or robotic exploration on a relatively smooth terrain within the inner ring of Schrödinger – either on the exposed melt sheet or on one of the basaltic units.

Based on geological mapping [3] and Clementine images, we evaluated three landing sites (Fig. 1) where most of the scientific objectives can be accomplished. The white circles in Fig. 1 outline a 10 and 20 km radius of an EVA range.

Conclusions: The Schrödinger Basin provides a diverse suite of scientific opportunities because of the proximity of different geologic units and its relatively good preservation. Any one of three possible landing sites will provide the first samples of basin melts of undisputable basin origin and potentially melts of SPA origin. In addition, at least two types of younger volcanism (and magmatic source regions) can be studied in the area.

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References: [1] O'Sullivan K. et al. (2010) *GSA Special papers*, in print. [2] NRC (2007) *The Scientific Context for Exploration of the Moon*. [3] Shoemaker E. M. et al. (1994) *Science, 266*, 1851–1854.

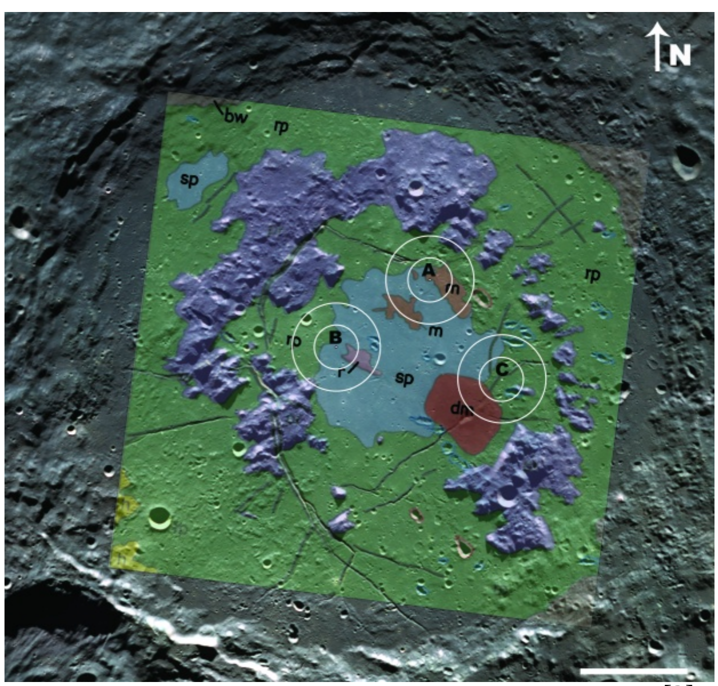

Figure 1: Clementine image of the Schrödinger basin with superimposed geological map by [3]. White bar is 50 km long, white dots are landing sites, and white circles are 10 and 20 km radii. The main units are smooth plains material (sp), rough plains material (rp), basin wall material (bw), hummocky material (h), peak ring material (pr) mare material (m), dark explosive volcanic material (dm), and ridged terrain (r). The sp unit is interpreted to be Schrödinger impact melt, and the rp unit to be Schrödinger impact melt breccia.