MORPHOLOGICAL FEATURES OF THE SLOPE MATTER IN CRATER SCHRODINGER. Y. Lu[1], J. S. Ping[1] and V.V. Shevchenko[2], [1]Research Group for Planetary Radio Science National Astronomical Observatories, CAS. Room A142, 20A Datun Road, Chaoyang District, Beijing, China, 100012 (lyxy@bao.ac.cn), [2]Sternberg State Astronomical Institute, Moscow Lomonosov University, Moscow, Russia.

Inroduction: On the basis of the images of the lunar surface obtained by the Chang'e-2 lunar probe and of the data of the large-scale survey from the LRO (Lunar Reconnaissance Orbiter) spacecraft we have studied the material in the slope in the lunar craters Schrodinger. Crater Schrodinger is interesting evidence of some of the most recent volcanic activity near the Moon's south pole. The Schrödinger impact basin is one of a few locations on the Moon that show evidence of geologically recent volcanic activity.

Schrodinger basin: A geological study of the basin shows evidence of lava flows and eruptions from vents. There is also older volcanic material and material scattered because of impacts. Possible, part of the observed lava flows are deposits from explosive eruptions. The crater Schrodinger is a good example of a peak-ring basin.

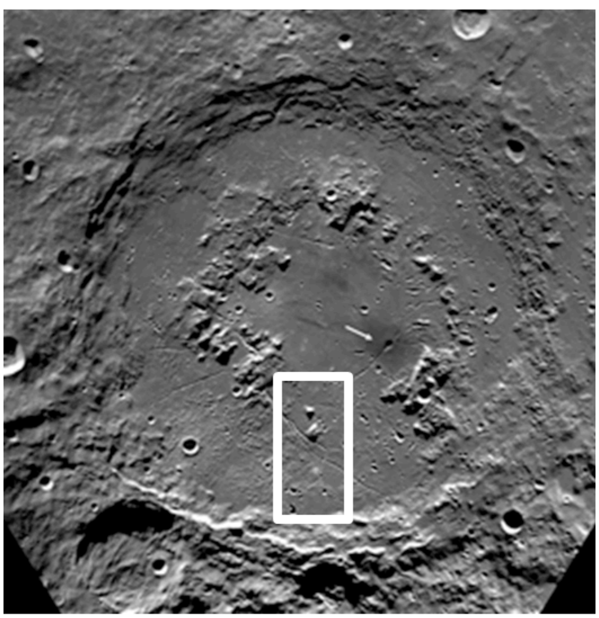

Fig. 1

Schrödinger Basin is ~320 km in diameter and located within the oldest and largest lunar basin, South Pole-Aitken (SPA). The geologic record at Schrödinger is still relatively fresh because the basin is only about 3.8 billion years. Fig. 1 shows mosaic of Clementine UVVIS images (750-nm band) of the Schrodinger Basin. In addition to the prominent, dark, cone-shaped feature (white arrow), Schrodinger has an inner ring of mountains partially encircling the basin floor (a 'peak ring complex') and a network of radial and concentric fractures.

Chang'e-2 lunar probe data: White rectangle in Fig 1 shows position of image from lunar probe Chang'e-2.

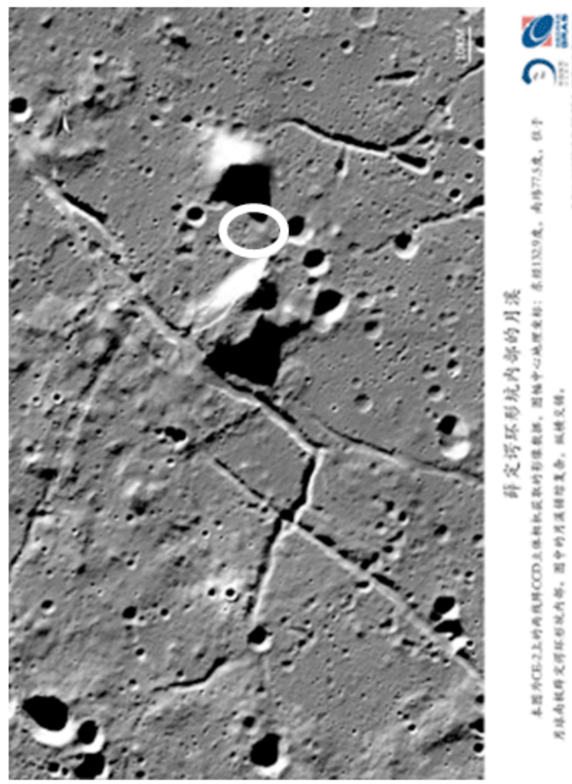

Fig. 2

Fig. 2 shows the central part of crater Schrodinger received from lunar probe Chang'e-2.

The area that was studied by us in details is indicated as white oval in Fig. 2.

Hills observed near the center of the image are parts of crater Schrodinger's peak-ring. Schrödinger is one of the youngest lunar basins. It's very interesting to compare morphological features of the crater's bottom and gravity data from Chang'E-1 satellite. The gravity map of the region is shown in Fig. 3. We can see a large negative gravity anomaly across the botton that is evidence of a great fault zone characteristic. The deep crustal structures of the region explains morphological features of the basin's bottom (see Fig. 1, 2).

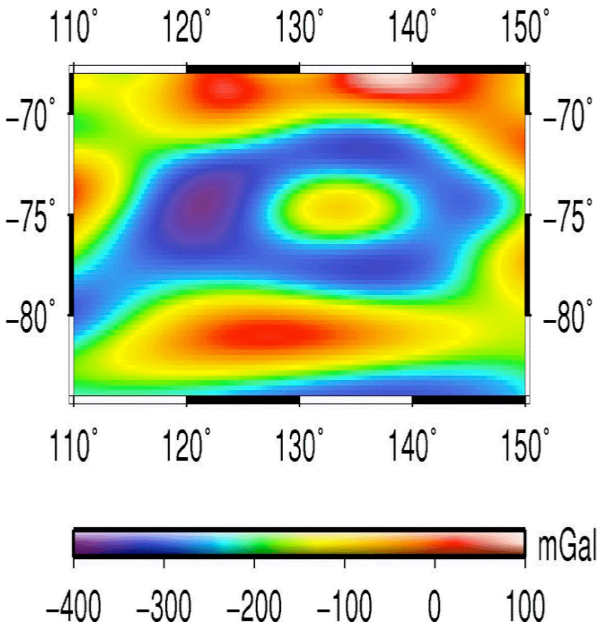

Fig. 3

Crater counts for the region around and within Schrodinger basin by Shoemaker et al. [1] indicate that it is likely the second-youngest basin on the lunar surface.

Age of the bottom processes: Shoemaker et al. [1] suggest that age of the processes may be less than 1 billion years old-ancient. It's still young in lunar terms.

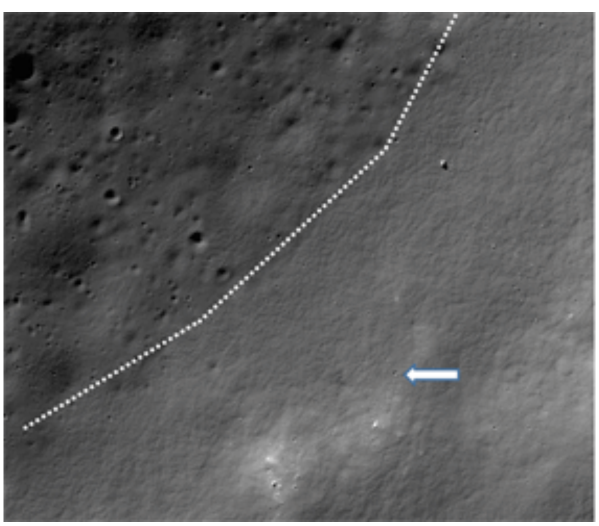

Fig. 4

Than we analysed fragment of the image from NASA LRO lunar probe. (The image fragment is located inside oval shown in Fig. 2).

Fig 4 shows fragment of NAC Frame M105982442L view is 1.614 km across (NASA/GSFC/Arizona State University). The dotted line divides two morphological types of landscape. We can see a large number of impact craters on the old surface (upper left) and the virtual absence of impact craters on the supposedly young surface (below right).

White arrow indicates the smallest visible crater with 10 m in diameter. The formation is lagest impact crater observed inside the area. Thus we can assume that the formation arose relatively recently.

A relatively young area, shown in Fig. 4 stands on a slope. Therefore, it can be assumed that part of the surface can be explained by the young age of slope avalanche processes. Detailed studies of slope avalanches in lunar craters, which can be considered as recent processes observed on the Moon, were begun by the authors in previous works [2-4]. According to these results material of the slope structures is distinguished by a low maturity rate. According to preliminary assessments using the optical maturity index and spectropolarimetric maturity index, the fresher slope formations can have an exposure age from several tens of years to several years. The method by Lucey et al. [5] makes it possible to estimate soil maturity, that is, to perform a comparative analysis of the exposure age of the material of slope avalanches.

According to our results soil maturity of the young landscape area (Fig. 4) corresponds to the exposure age equal 0.6 – 0.8 billion years. This finding is consistent with the fact the practical absence of impact craters with a diameter of more than 10 meters.

Conclusion: Our results confirm that LROC NAC and Chang'e-2 closeup clustered craters on the Schrodinger pyroclastic cone, one of the NASA Constellation regions of interest. Although likely relatively young, the craters in this area have a subdued appearance because they formed in the loose pyroclastic material.

References: [1] Shoemaker, E.M. et al. (1994) *Science, 266*, 1851-1854. [2] Shevchenko, V.V., Pinet, P.C., Chevrel, S., et al. (2007) *LPS XXXVIII,* Abstract # 1066. [3] Lu, Y. and Shevchenko, V.V. (2011) *Proc. LPS XLII,* Abstract # 1254. [4] Ya. Lu, V.V. Shevchenko, (2012) *Solar System Research, 46,* No. 4, p. 253–262. [5] Lucey, P.G., Blewett, D.T., Taylor, G.J., and Hawke, B.R. (2000), *JGR,105,* 20 377–20 386.