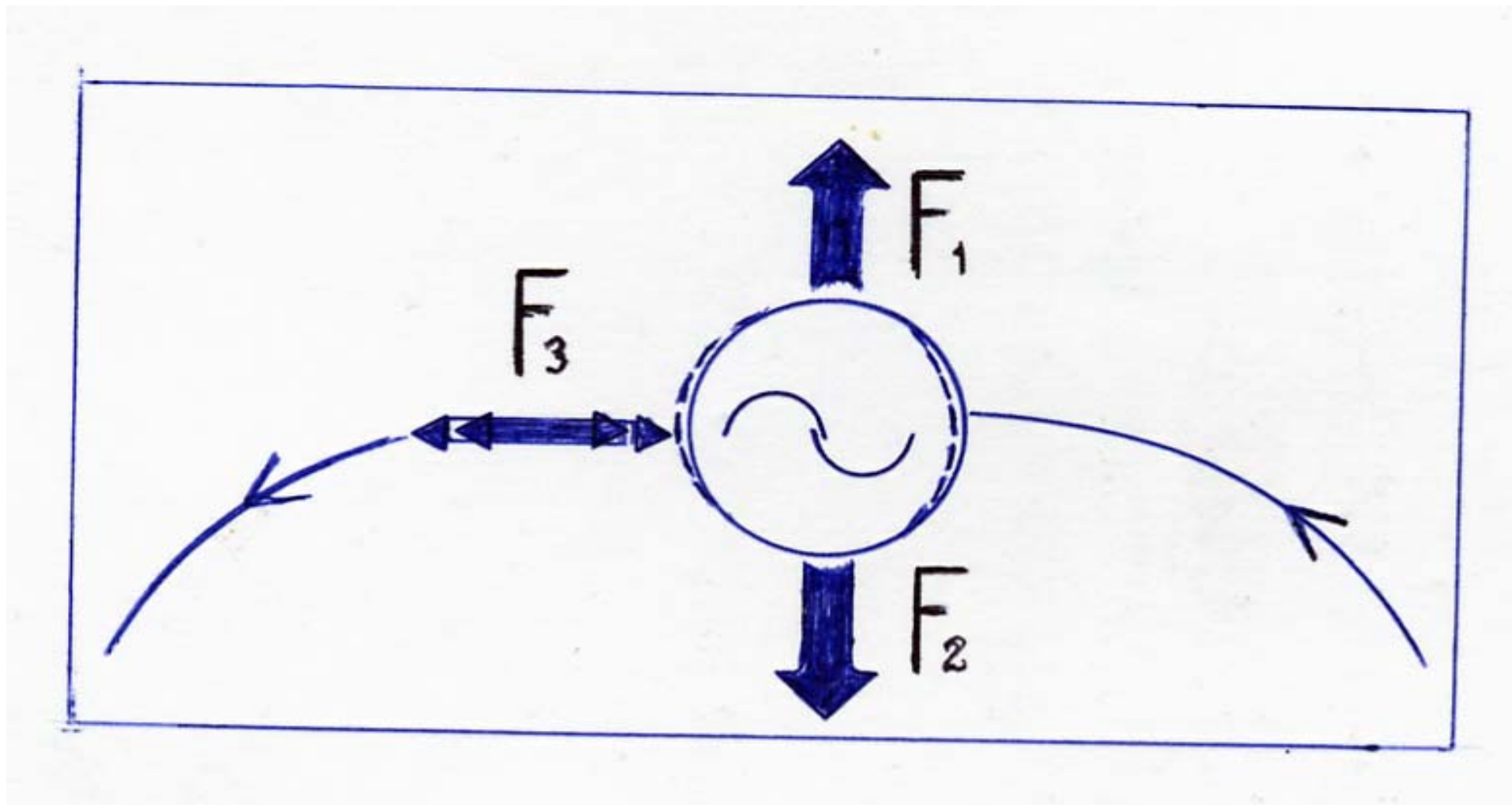


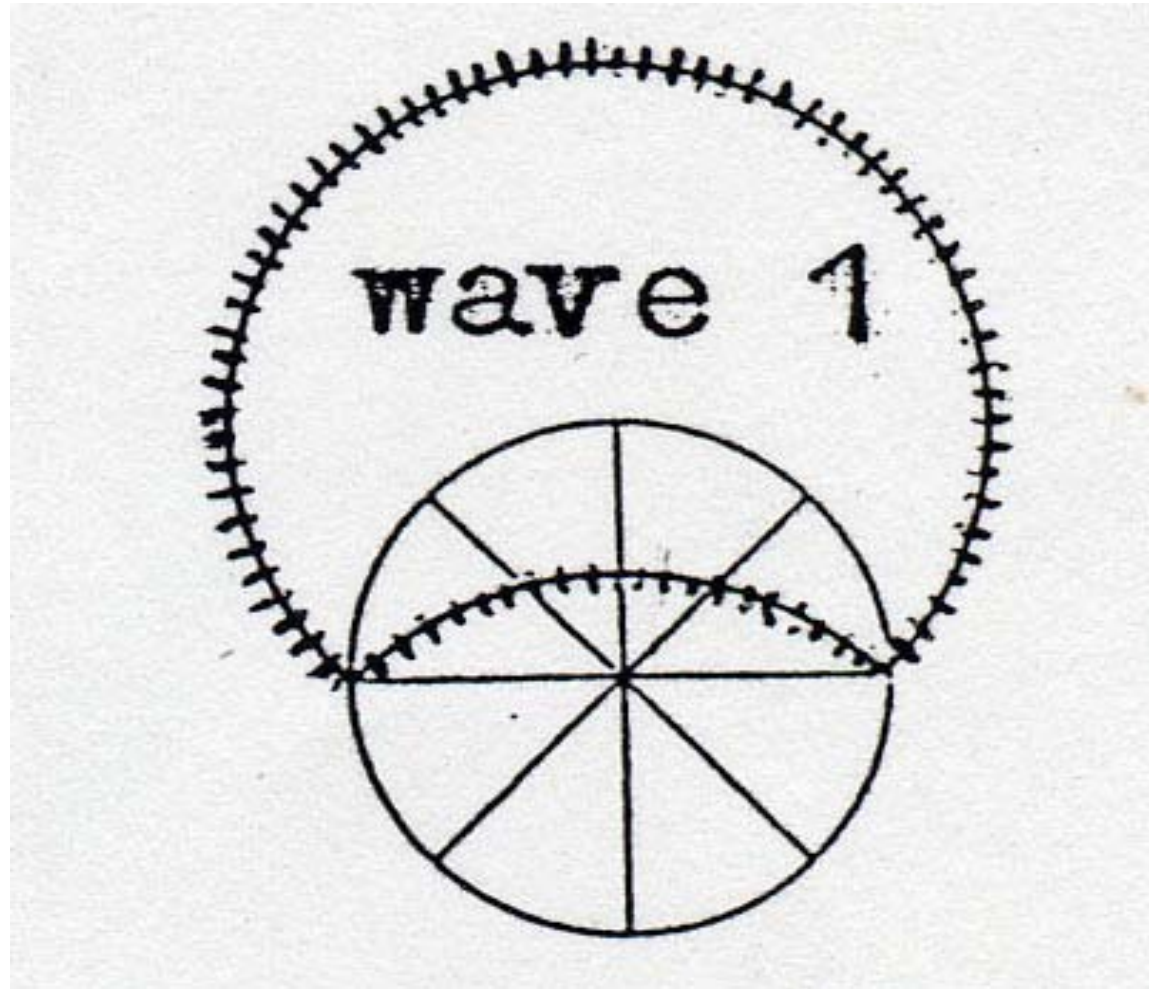
**Морфологические  
особенности Луны,  
связанные с ее волновой  
тектоникой: рахмах рельефа  
и происхождение Бассейна  
Южный полюс-Эйткен**

**Г.Г. Кочемасов  
ИГЕМ РАН**

# Космическое тело на кеплеровской орбите



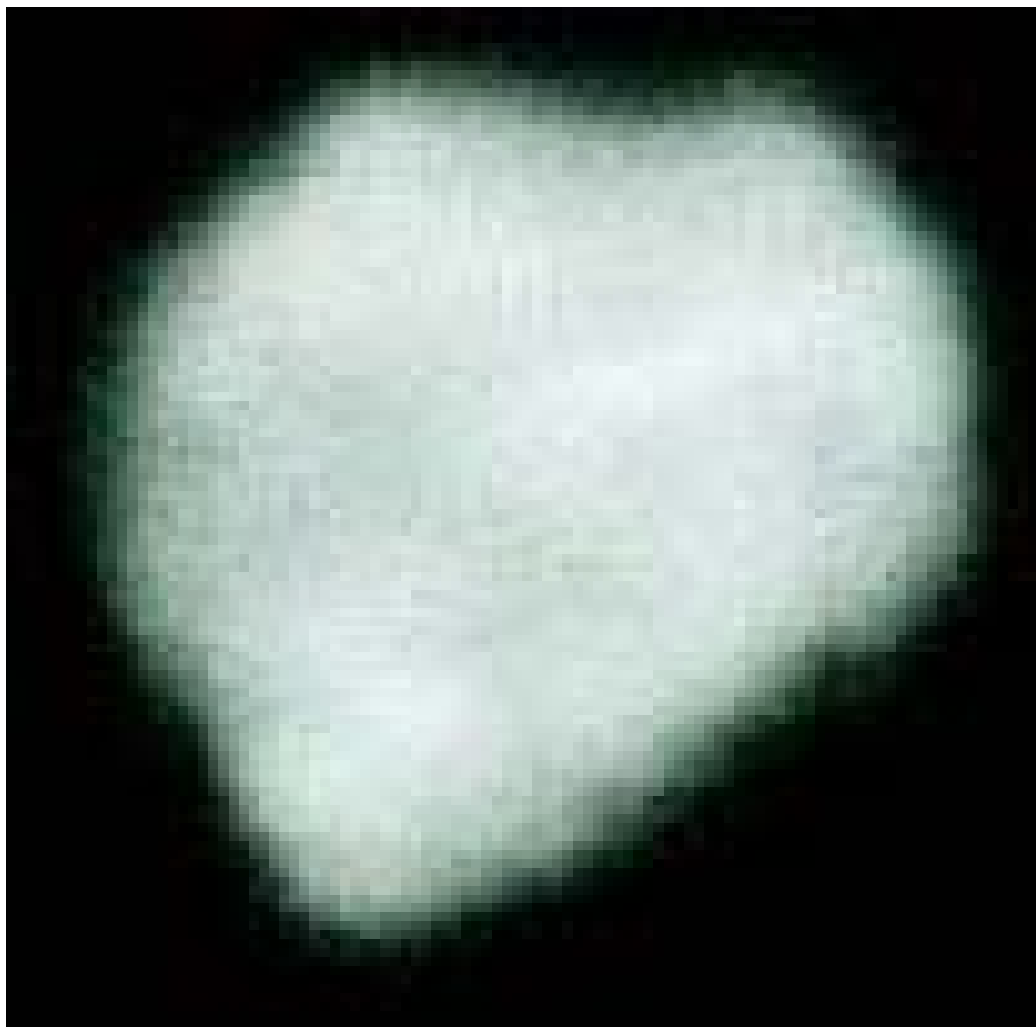
# Коробление фундаментальной ВОЛНОЙ



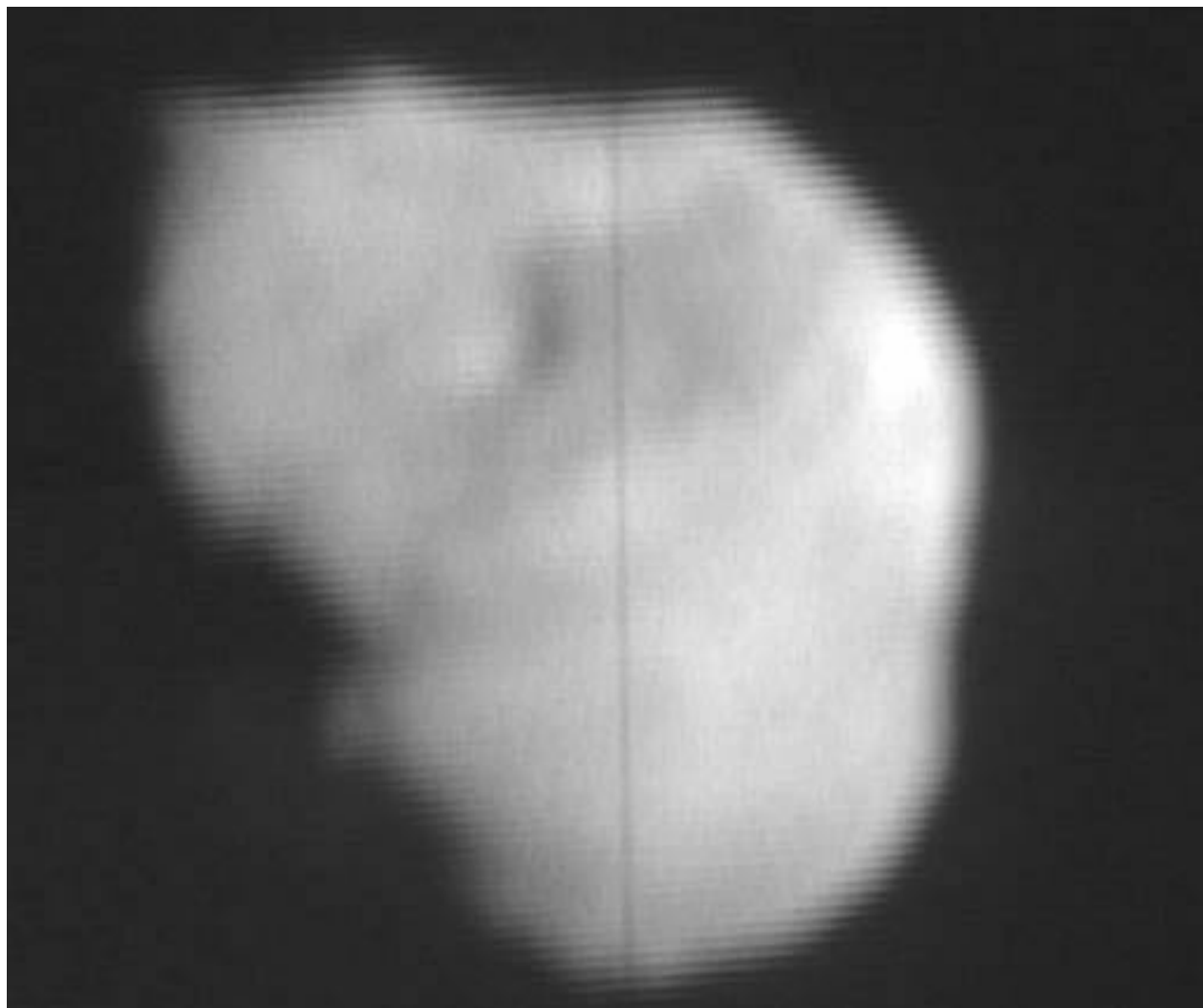
# Спутник Деймос, 16 км



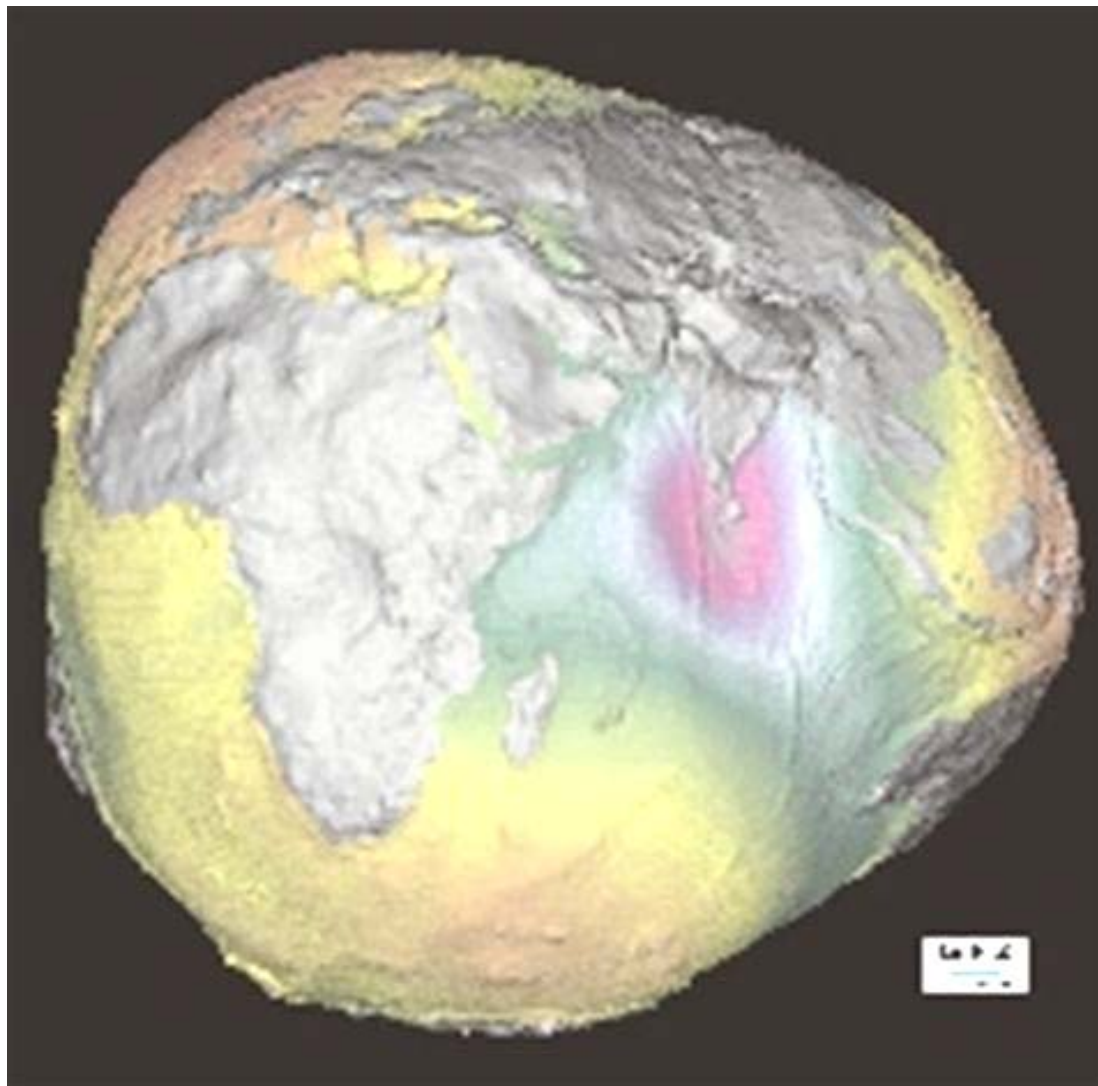
# Астероид Джуно



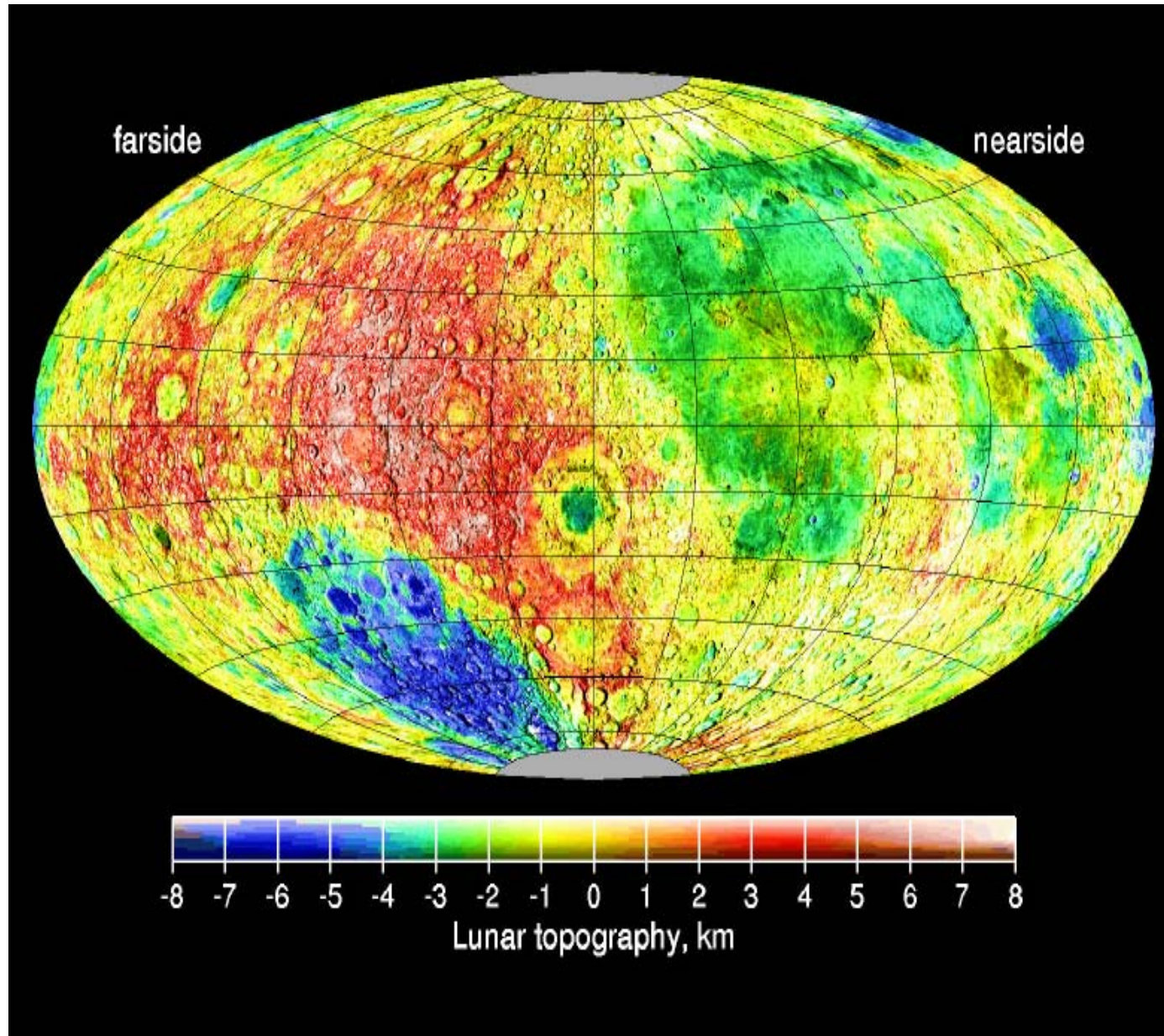
# Комета Темпел, 7,6 км



# Геоид Земли (искаженный масштаб)

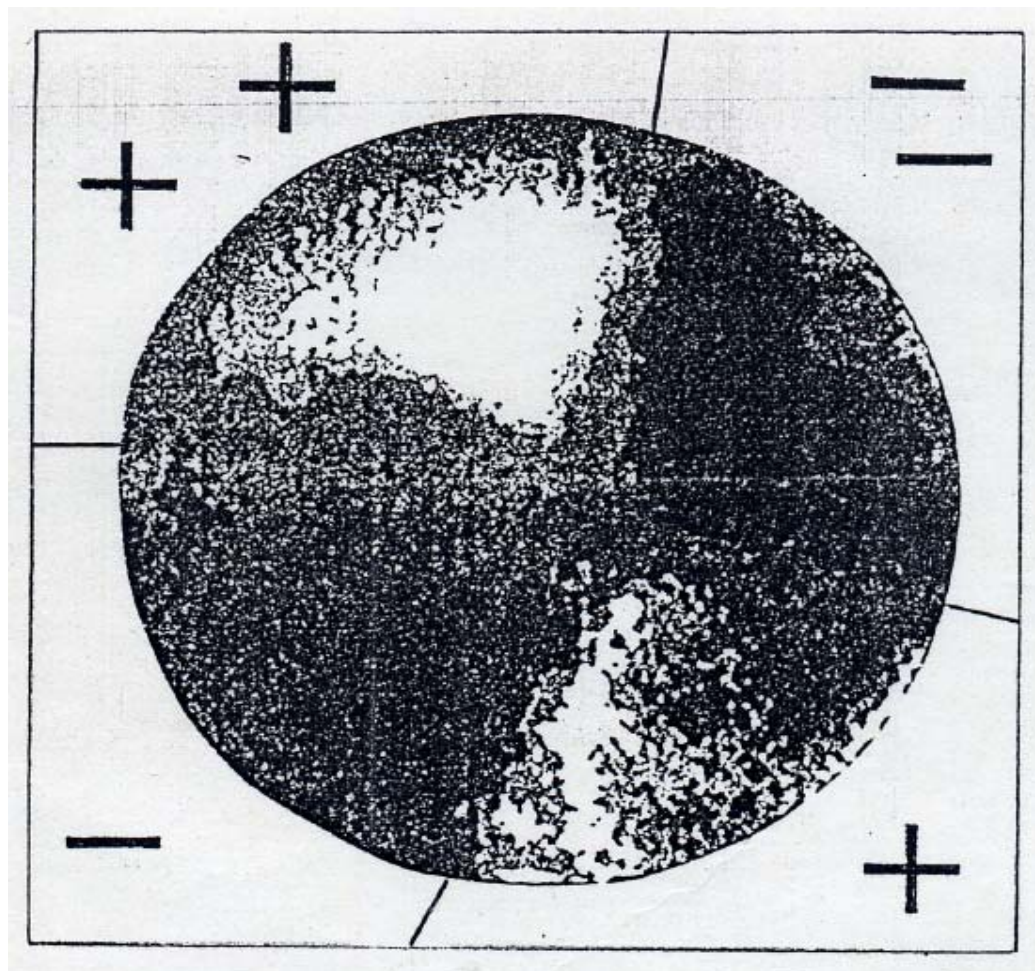


# Moon, topography

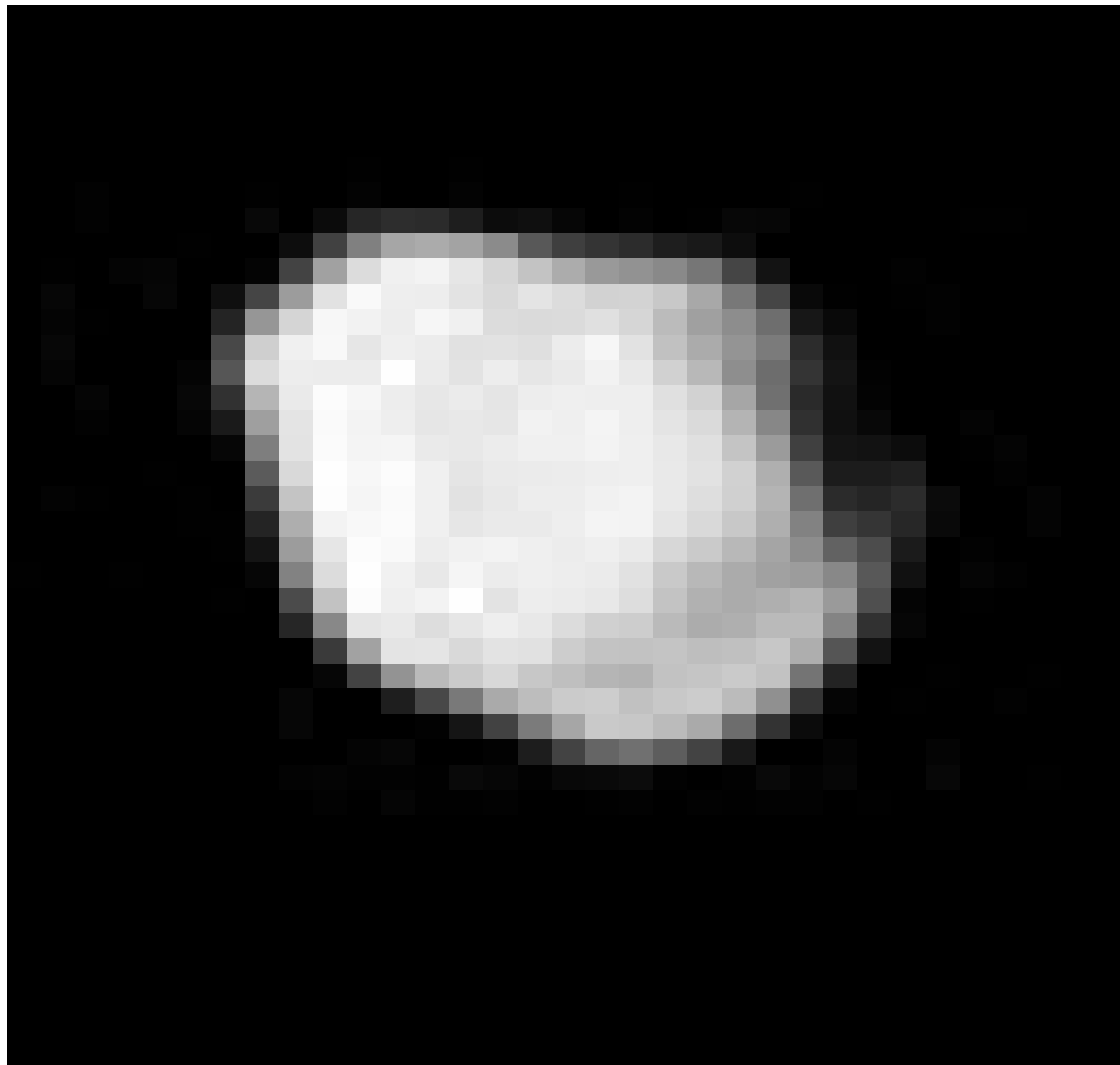




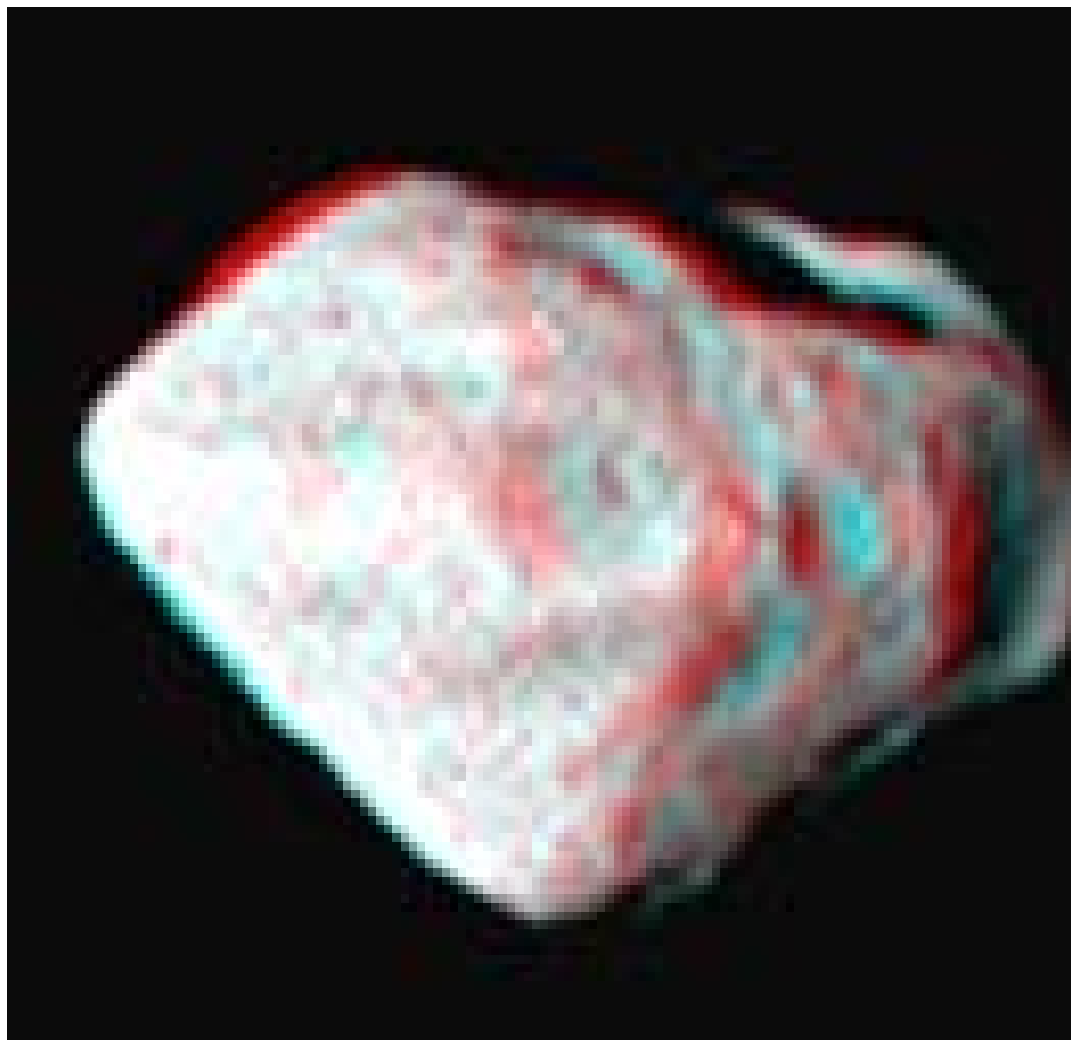
Марс, отношение  
интенсивностей света в  
диапазонах....



# Астероид Лютеция, 124 км



# Астероид Стейнс, 4,6 км

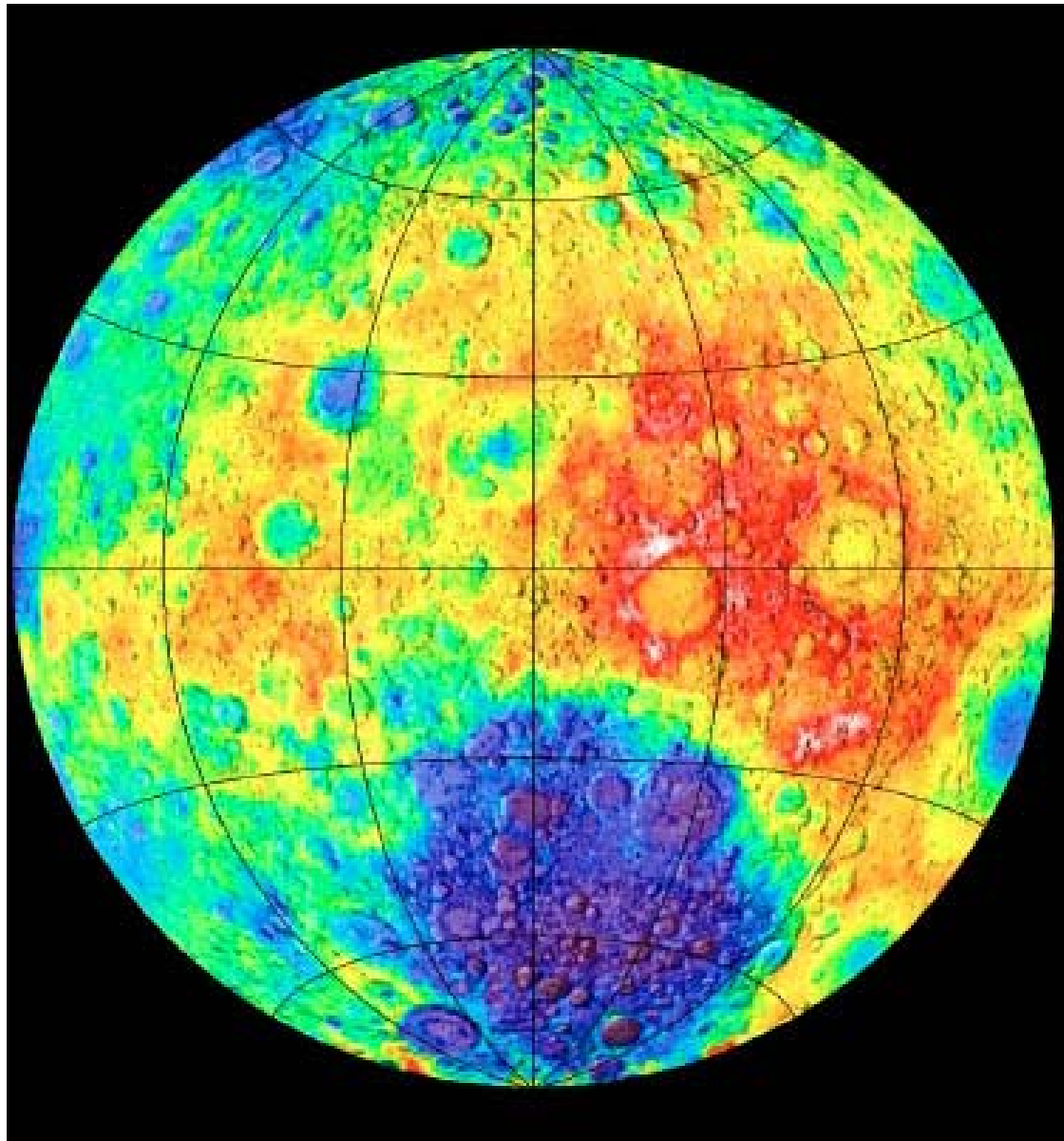


# Янус

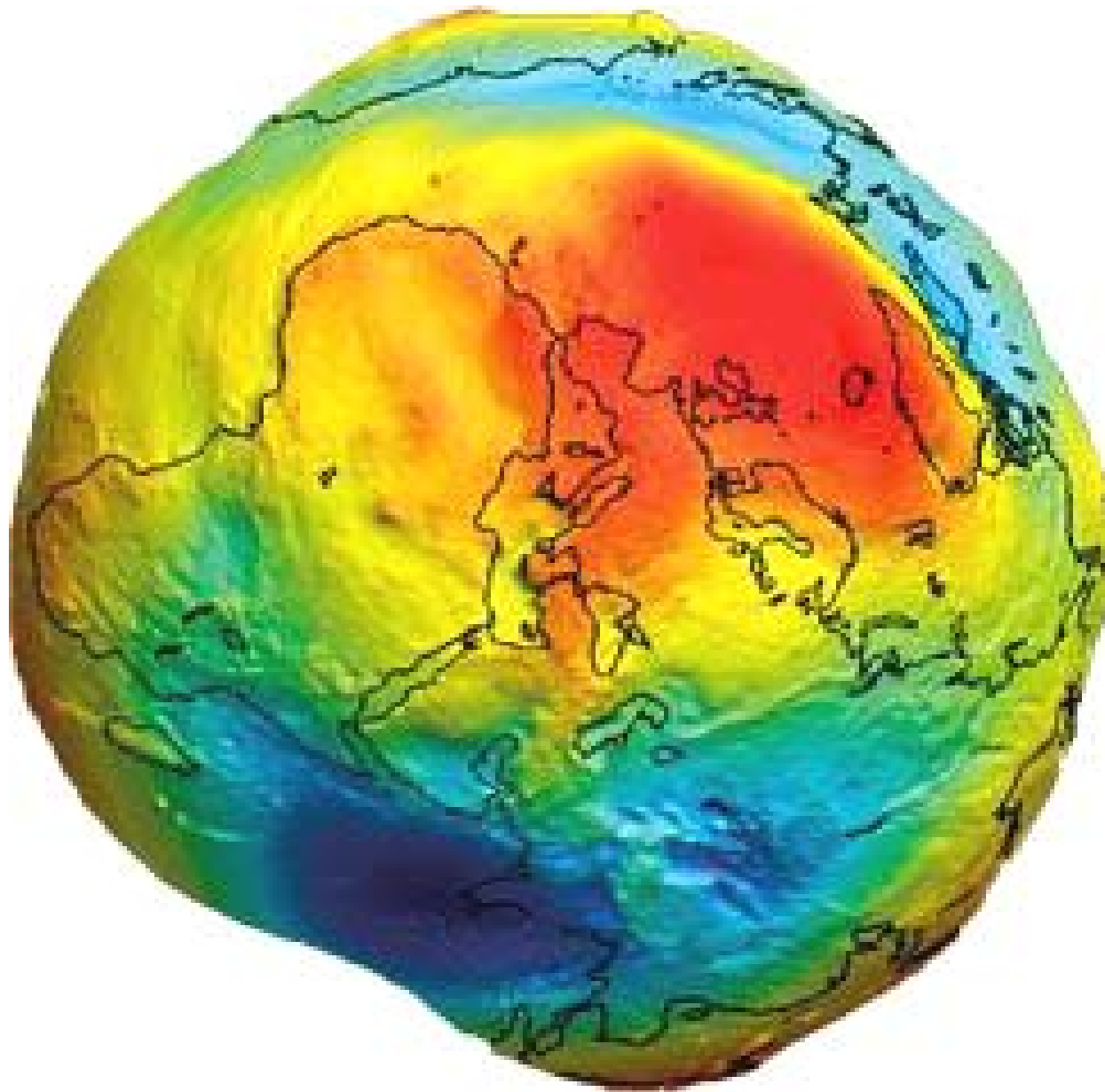
Р1А08192, 220 км



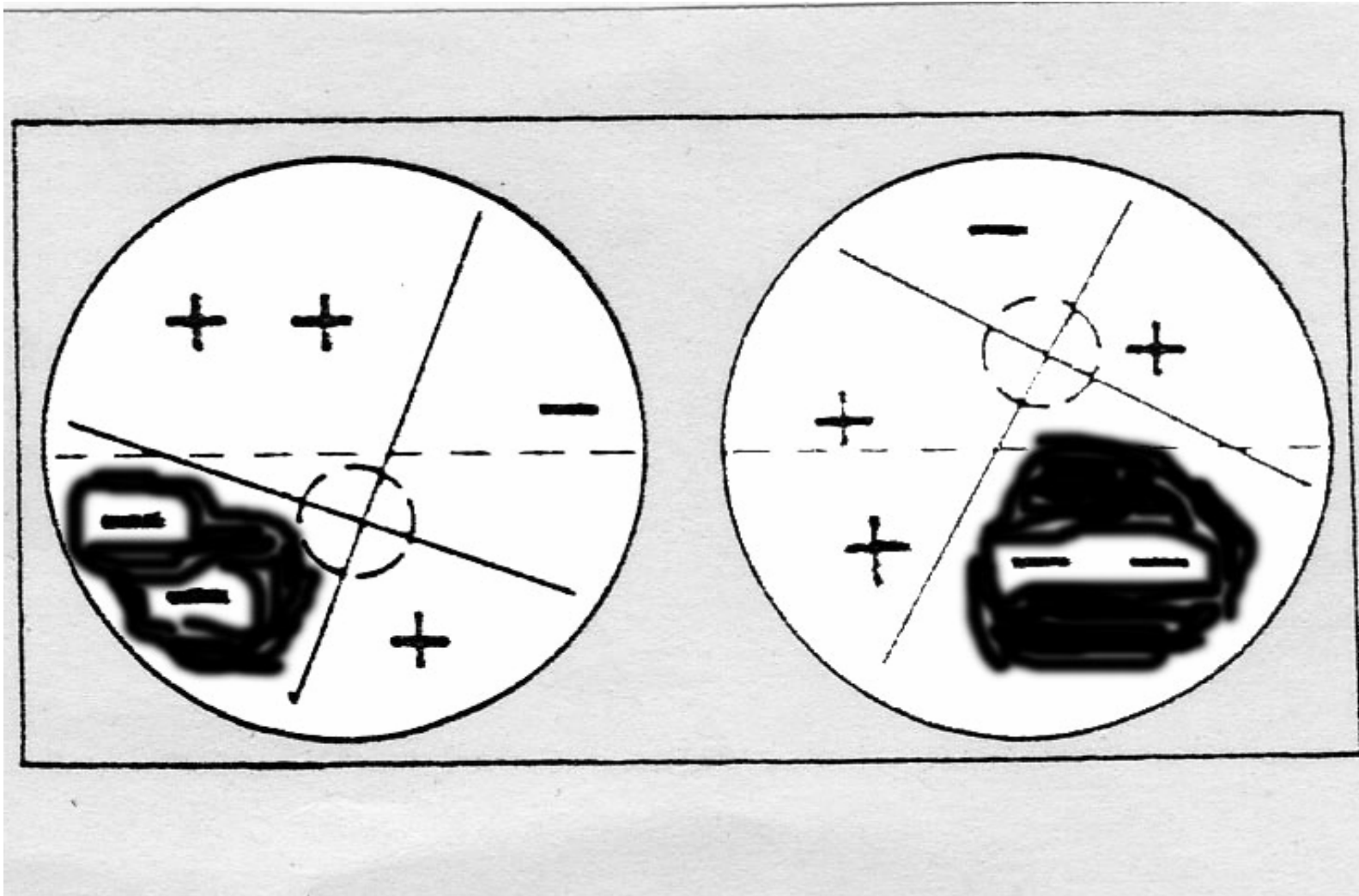
# Геоид Луны

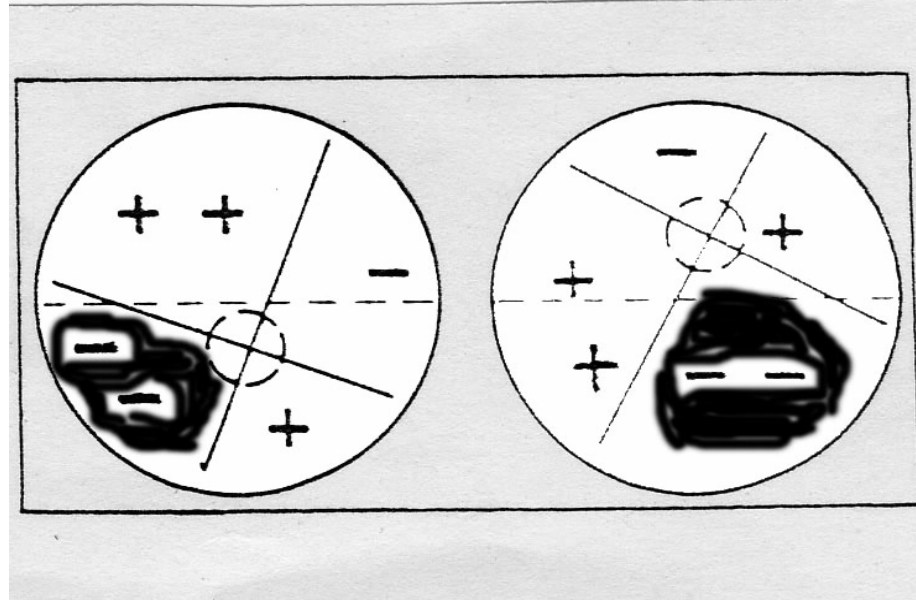
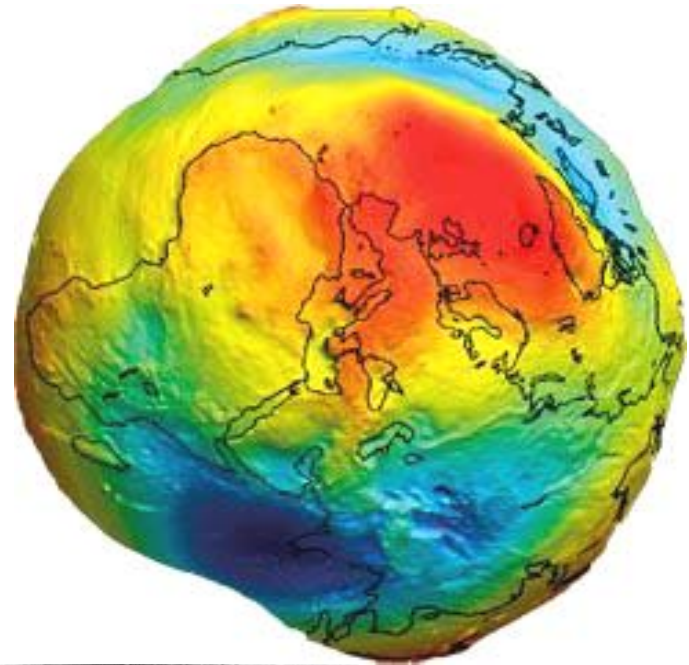
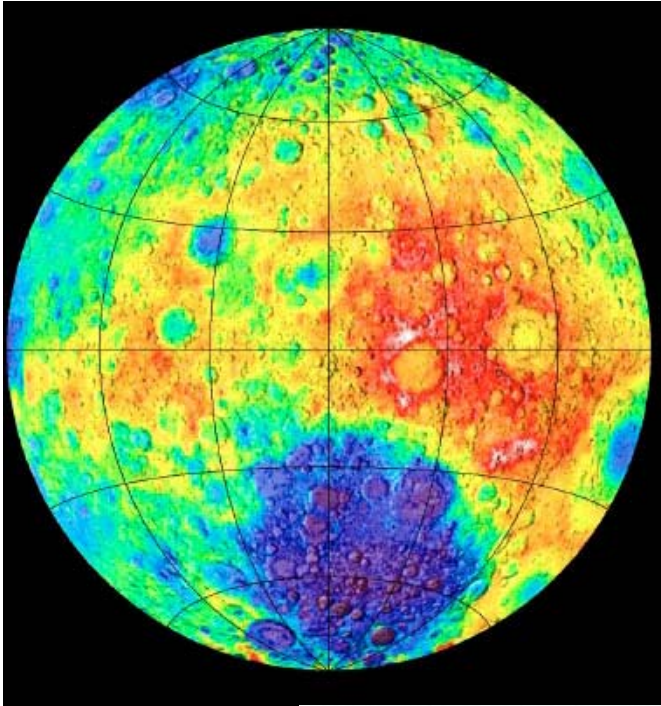


# Геоид Земли



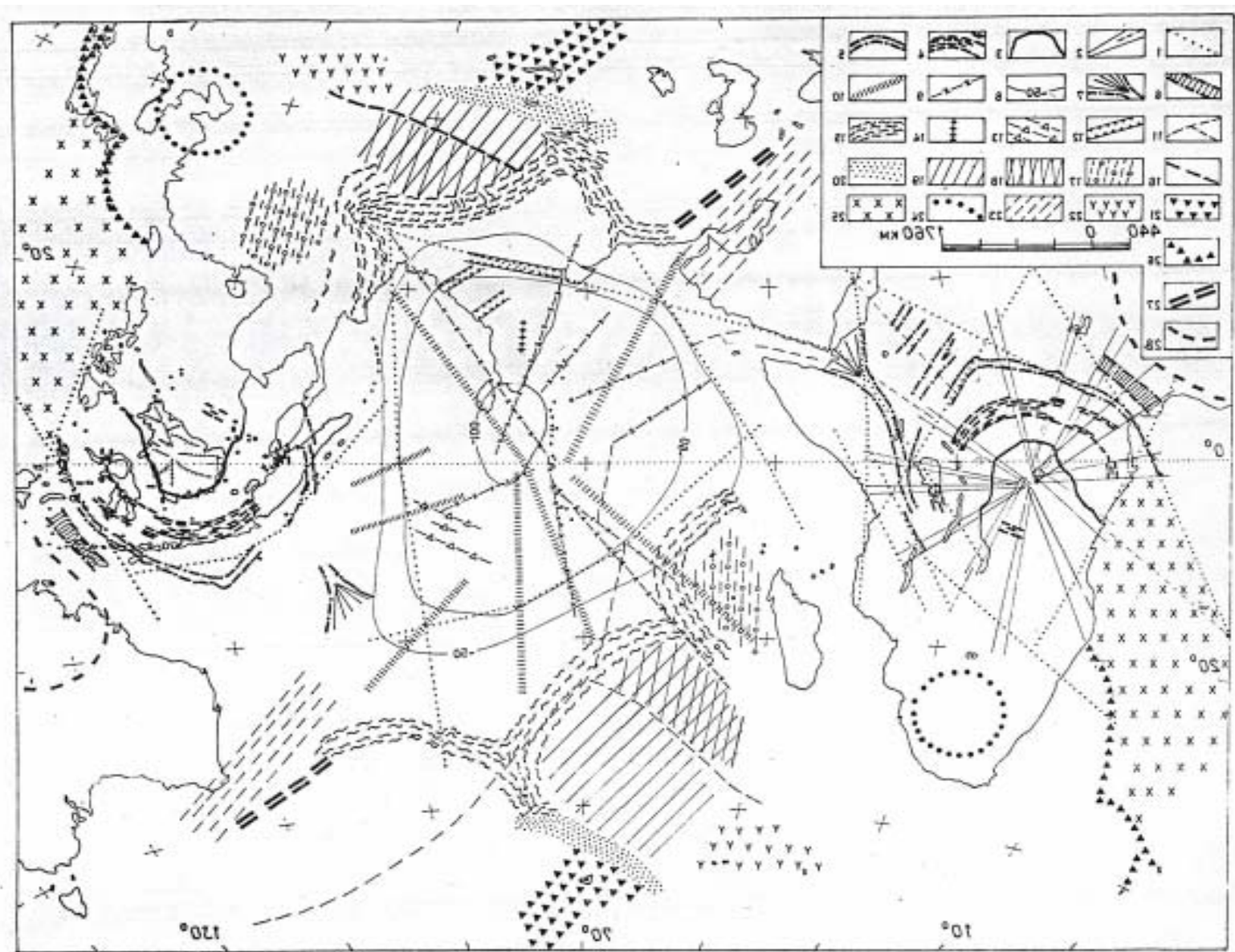
# Секторы Луны (слева) и Земли $\pi R$ -structures



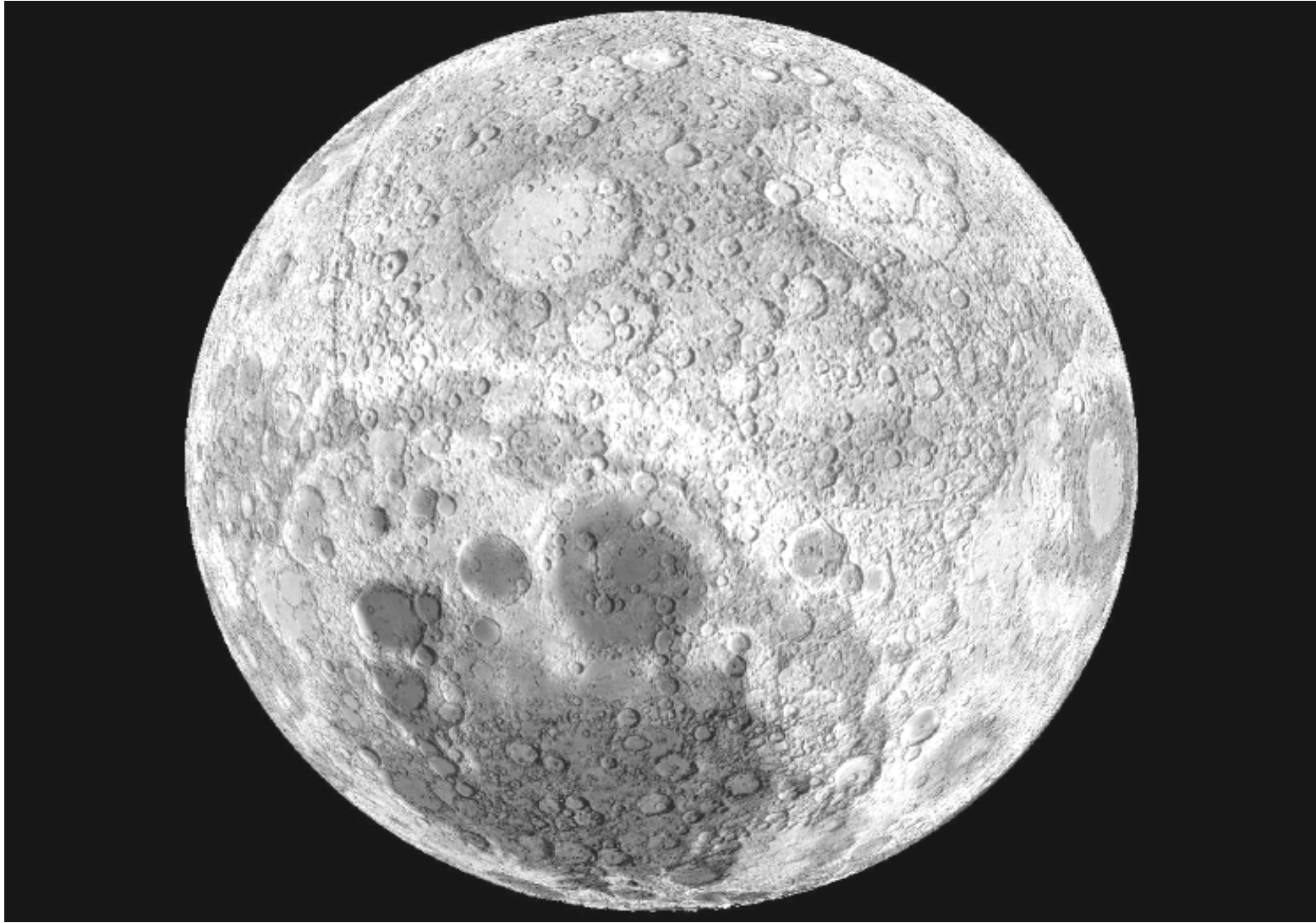




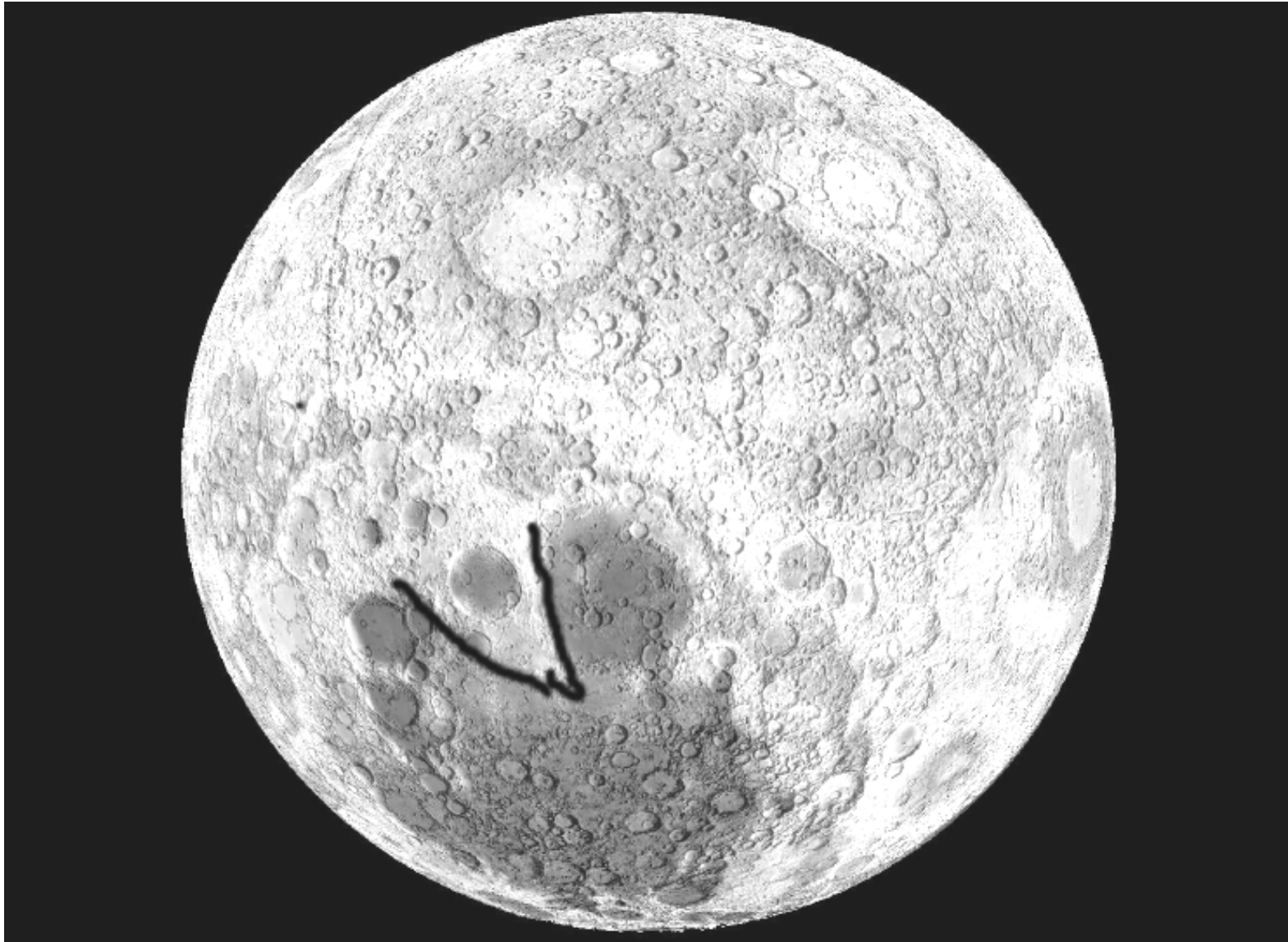
# Структурная схема Восточного полушария



# SPA Basin-inner structure



# SPA Basin-inner structure



# Global Lunar Conference 2010

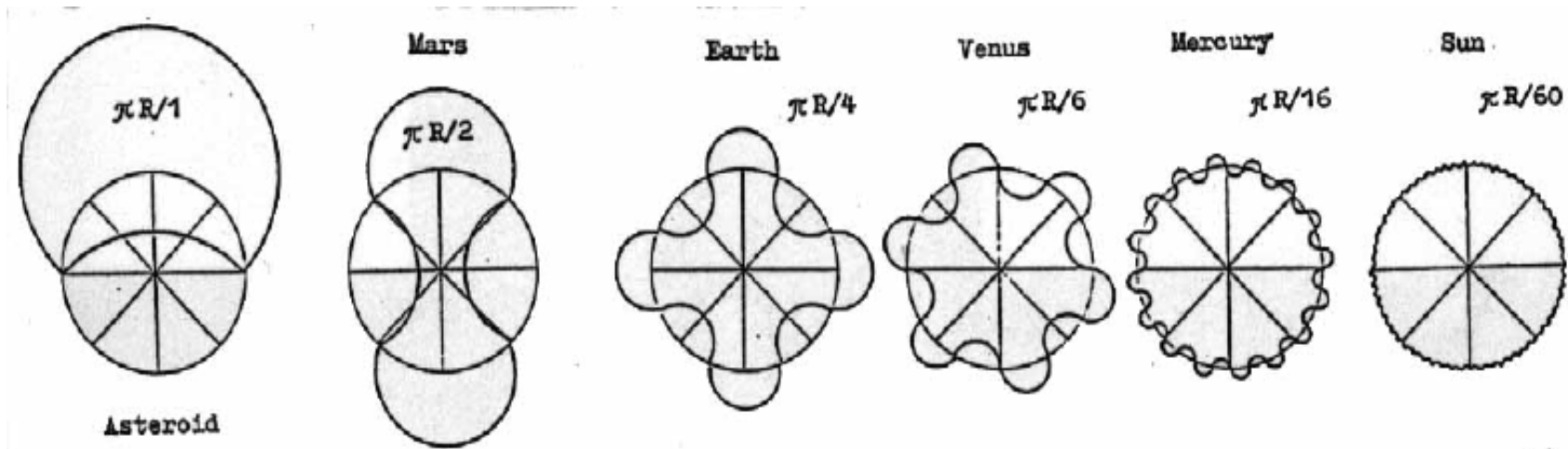
## The lunar relief: a calculation of its range.

G.G. Kochemasov

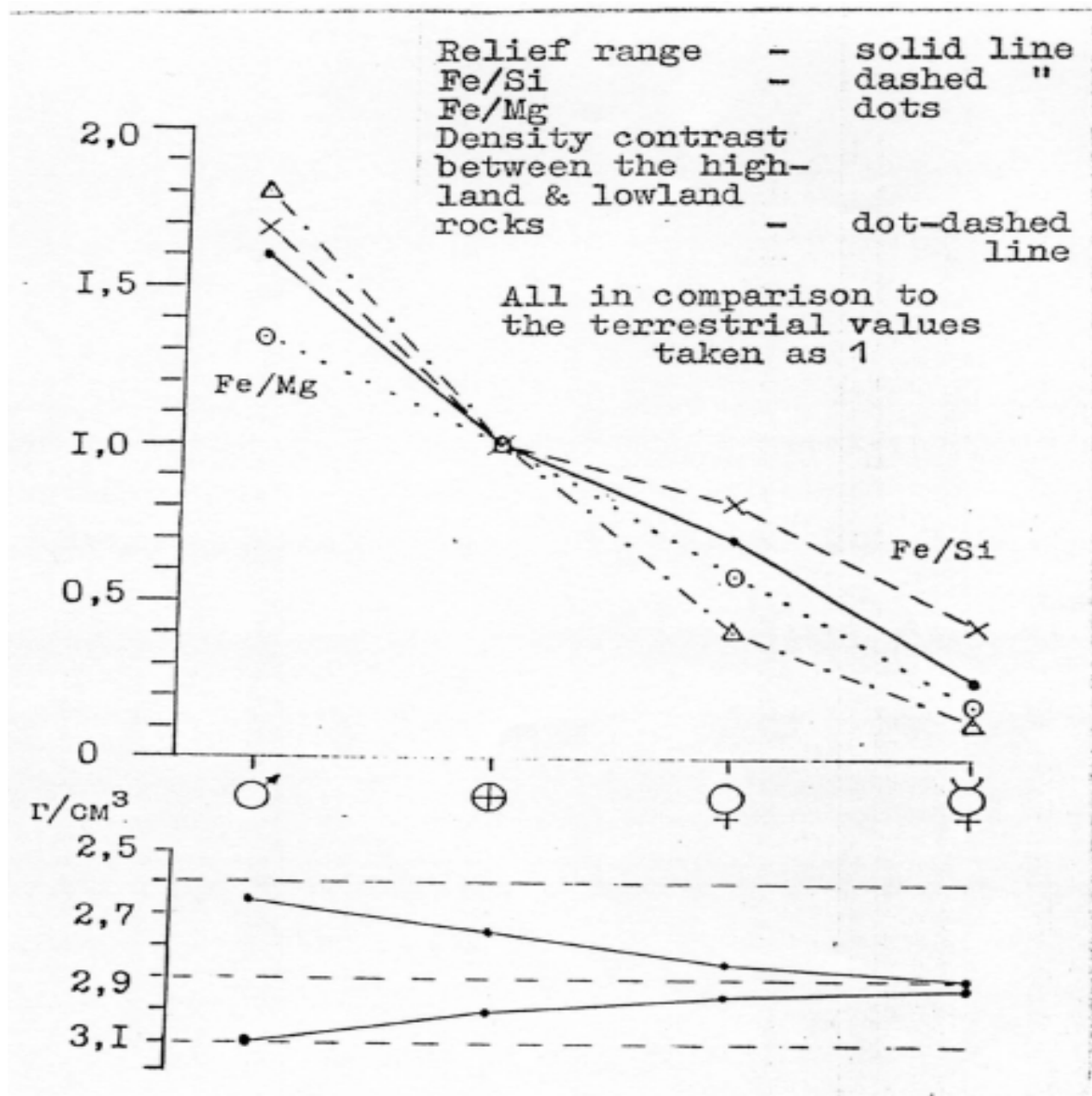
IGEM RAS, 35 Staromonetny, 119017 Moscow, Russia, <kochem.36@mail.ru>

Intensive lunar explorations of the past and the Kaguya mission reveal that an overall lunar relief range is about 16 km. It is less than the terrestrial relief range about 20 km. The comparative wave planetology (Kochemsov, 1998-2009) has shown that in the row of terrestrial planets there is a rather well correlation between radii of tectonic granules increasing with solar distance and surface relief ranges of planets. The relief ranges also increase with solar distances of planets. Due to bodies movement in elliptical orbits with changing accelerations they are warped by inertia-gravity (tectonic) waves having in rotating bodies four intersecting directions. An interference of these directions produces uprising and subsiding tectonic blocks –granules whose sizes are inversely proportional to the planets' orbital frequencies (Theorem 3 of the planetary wave tectonics). Thus, there is the following row of the granule sizes (a half of the warping wavelength) starting from the solar photosphere: photosphere  $\pi R/60$ , Mercury  $\pi R/16$ , Venus  $\pi R/6$ , Earth  $\pi R/4$ , Mars  $\pi R/2$  ( $R$ -a body radius). Corresponding relief ranges are: Mercury  $\sim 1-4$  km, Venus 14, Earth 20, Mars  $\sim 30$  km. But the Moon being a satellite has two orbits: around Sun and Earth. Two orbits, thus, influence its relief-forming potential. Induced by the terrestrial orbit (1/1 year frequency) 20 km range have to be diminished (smoothed) by the fast photosphere orbit (1/1month frequency) producing rather negligible relief range. A more substantial smoothing, however, can be done by one of two modulated frequencies. For the Moon one has to consider 2 main frequencies (around Earth and Sun) and 2 modulated side frequencies (division and multiplication of the higher frequency by the lower one). It appears that the lunar crater size-frequency curve has anomalously high numbers of craters exactly at ranges calculated by the wave approach, namely, at 80-140 and more than 600 km in diameter (corresponding to the main orbital frequencies) and 10-30 and 300-400 km in diameter (corresponding to the modulated side frequencies). The main frequencies produce granule (crater) sizes  $\pi R/4$  and  $\pi R/60$ ; side frequencies give sizes  $\pi R/240$  and  $\pi R/15$ . The radii of the  $\pi R/60$  and  $\pi R/240$  granules produce very weak surface roughness to significantly smooth the 20 km  $\pi R/4$  relief. But tied to the  $\pi R/15$  granule (almost similar to the  $\pi R/16$  Mercury granule) relief has rather important roughness (relief range) diminishing 20 km to sought for about 16 km ( $20-4=16$ ).

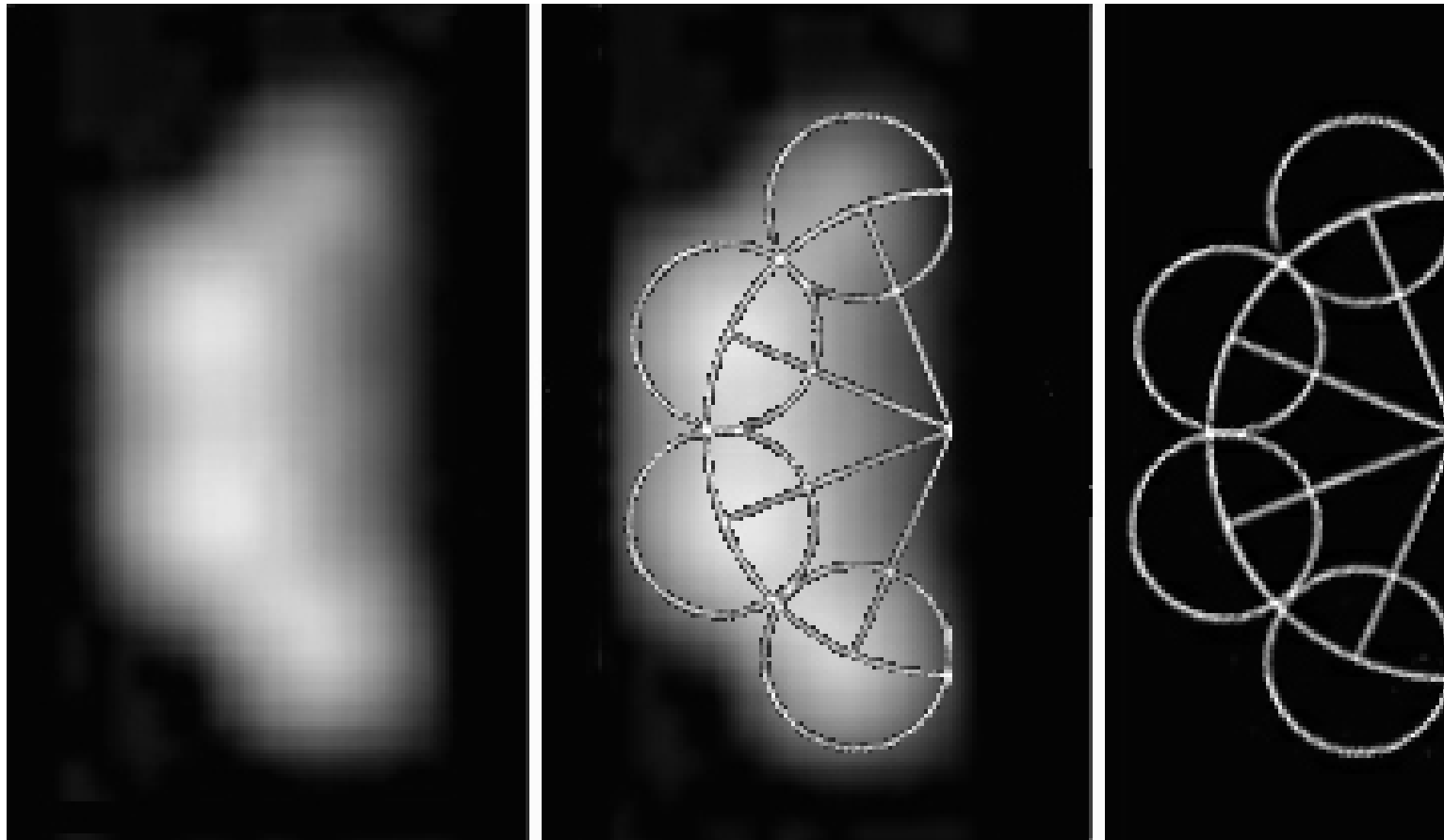
# Планеты – геометрическая модель тектонической зернистости



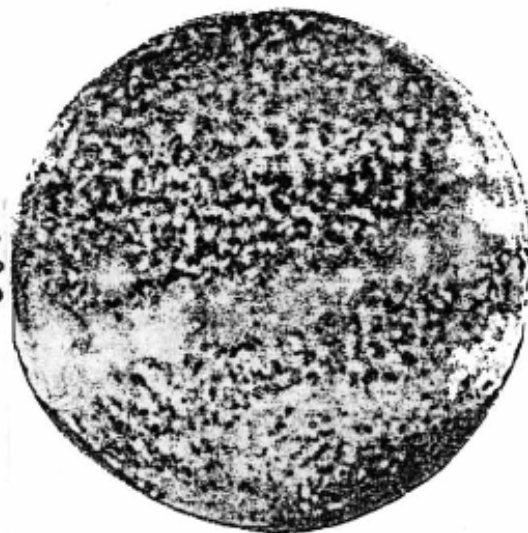
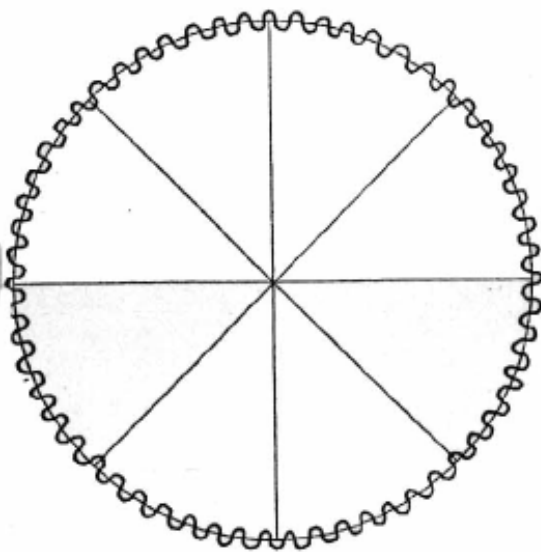
# Химизм-плотность-рельеф планет земной группы



# Земля с расстояния 1,3 млн. км и ее теоретическая тектоническая грануляция



# Гравика Луны и супергрануляция Солнца





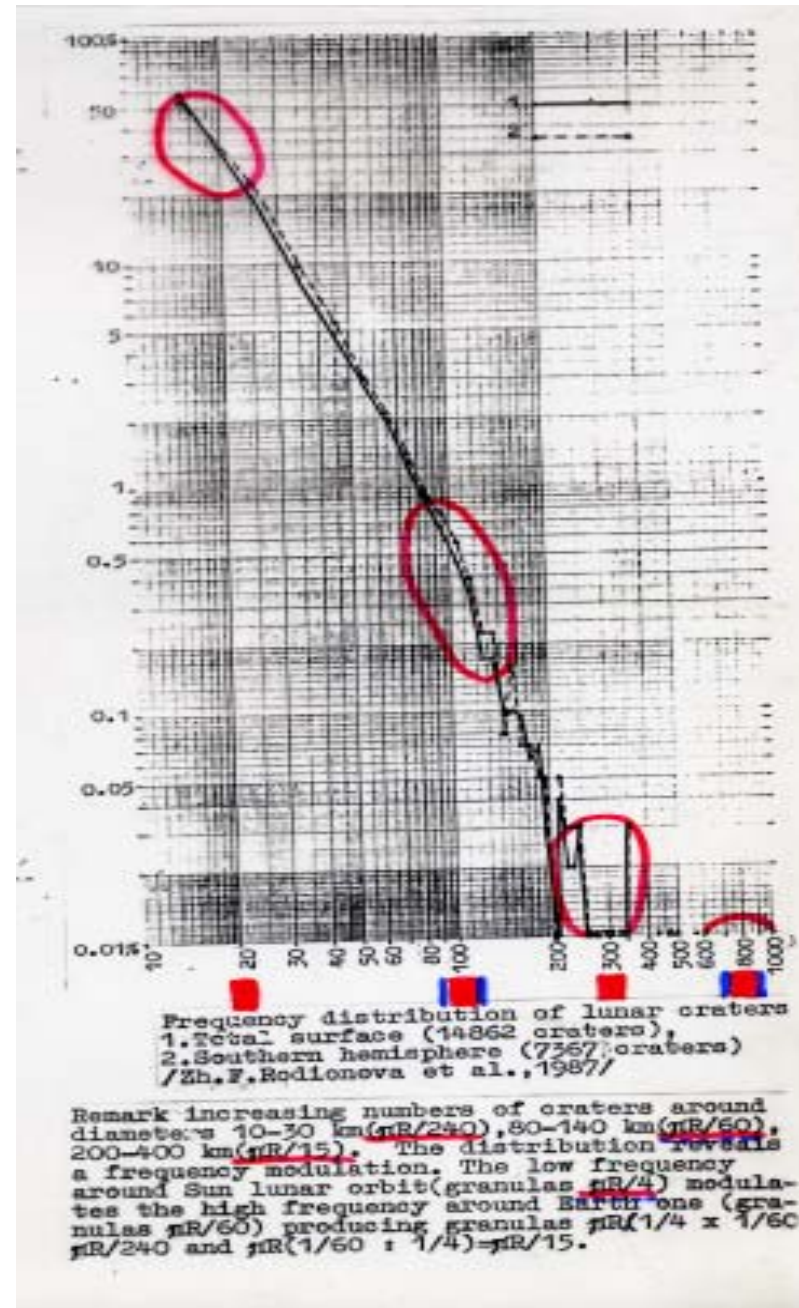
# Размах рельефов планет

- **Марс      Земля      Венера      Меркурий**
- Радиус гранулы:
- **$\pi R/4$        $\pi R/8$        $\pi R/12$        $\pi R/32$**
- Фактический размах рельефа
- **30 км      20 км      14 км      1-4 км**

## Две орбиты Луны – модуляция частот и появление дополнительных гранул

- Волновая модуляция высокой частоты низкой частотой приводит к образованию на спутнике Луне тектонических гранул четырех размеров:
- два главных и два модулированных
- $\pi R/4$ ,  $\pi R/60$ ,  $\pi R/240$ ,  $\pi R/15$
- Более 600 км, 80-140, 10-30, 300-400

# Кумулятивная кривая размер кратеров-частота для Луны



# Луна

- $\pi R/4 - \pi R/15 = 20 \text{ км} - 4 \text{ км} =$

- $16 \text{ км}$

**Благодарю за внимание**

# Волновое коробление, начавшееся на стадии аккреции, и происхождение Луны

