



The European Space Agency's Rosetta spacecraft, with NASA instruments aboard, flew past asteroid Lutetia on Saturday, July 10, 2010. The asteroid diameter is about 130 km. This photograph was taken from a distance of 3,162 km.

Problem 1 - What is the scale of this image in meters/mm if the width of the image is 130 kilometers?

Problem 2 - At a distance of 3,162 km, A) what was the angular diameter of this asteroid? B) Compared to the full moon viewed from Earth (0.5 degrees), how much larger was Lutetia?

Problem 1 - What is the scale of this image in meters/mm if the width of the image is 130 kilometers?

Answer: $130 \text{ km} / 152 \text{ mm} = \mathbf{855 \text{ meters/mm}}$.

Problem 2 - At a distance of 3,162 km, A) what was the angular diameter of this asteroid? B) Compared to the full moon viewed from Earth (0.5 degrees), how much larger was Lutetia?

Answer: A) $\tan(\theta) = 130/3162$ so $\theta = \mathbf{2.3 \text{ degrees}}$.

B) Asteroid is $2.3/0.5 = \mathbf{4.6 \text{ times}}$ larger than the diameter of the full moon.