

Universidade Federal de Alfnas
Programa de Pós-graduação em Estatística Aplicada e Biometria
English Proficiency Exam

Registration number: _____

Read the text carefully and answer the questions. Don't forget, you must answer only in Portuguese! Answers in English will not be considered.

Reference: CASTELVECCHI, D. Success of Gravity-Wave Satellite Paves Way for 3-Craft Mission. **Nature magazine**. 2017. Access: June 27th, 2017. Available in: <https://goo.gl/XMzjjX>.

Success of Gravity-Wave Satellite Paves Way for 3-Craft Mission

Europe's gravitational-wave hunters are celebrating. On July 1, a satellite will wrap up its mission to test technology for the pioneering quest to measure gravitational ripples in the stillness of space. Over the past year, the craft has performed much better than many had hoped. That success has convinced the European Space Agency (ESA) to give the go-ahead to a full-scale version able to sense cataclysmic events that can't be felt on Earth.

The LISA Pathfinder mission, launched in late 2015, beat its precision target by a factor of 1,000 and quieted critics who have doubted its potential, says project scientist Paul McNamara, an astrophysicist at ESA in Noordwijk, the Netherlands. "This is not the impossible task that some people believed it was."

Currently set to fly in 2034, the full-scale Laser Interferometer Space Antenna (LISA) will be the space analogue of the Laser Interferometer Gravitational-Wave Observatory (LIGO), two machines in the United States (each with a pair of 4-kilometre-long arms) that first detected the ripples by 'hearing' the merger of two black holes. LISA's three probes will fly in a triangle, millions of kilometres apart, making the mission sensitive to much longer gravitational waves, such as the ripples produced by the collisions of even larger black holes.

The mission will bounce laser beams between the three LISA craft (or, more precisely, between test masses suspended in a vacuum inside each satellite). Taking advantage of the vibration-free conditions of space, it will measure tiny variations in the distances between the test masses that reveal the passage of space-warping gravitational waves.

Question 1: When that text was accessed and who is its author?_____

Question 2: How would you translate the title of the text? _____

Question 3: What is this text about?_____

Question 4: Why gravitational-wave hunters are celebrating?_____

Question 5: What did the ESA do when the craft performed much better than many had hoped?_____

Question 6: Who is Paul McNamara and where he lives?_____

Question 7: What did Paul McNamara say?_____

Question 8: What LISA's three probes will do?_____

Question 9: What is going to be set to fly in 2034?_____

Question 10: How the passage of space-warping gravitational waves will be measured?_____
