

# History of geodesy



**ASSIGN  
BUSTER**

## Assignment 1 History of Geodesy

1. Complete the following timeline by providing one important figure in the history of geodesy for each designated time period. Please include their name, nationality, and scientific contribution/importance. [18 points]

600 BC - 200 AD

Name : Eratosthenes

Nationality: Greek (Born in town of Cyrne which is now the town in Libya)

Contribution: founder of Geodesy; measured size of the Earth; obliquity of spin axis; map of the world; one interconnected ocean

100 - 1500 AD

Name : Giordano Bruno

Nationality: Italian

Contribution: proposed that the stars were just distant suns surrounded by their own exoplanets and raised the possibility that these planets could even foster life of their own, the universe is in fact infinite and could have no celestial body at its "center", burned at the stake in Rome on February 19, 1600 for belief in heliocentric theory and other ideas

1600 AD

Name : Tycho Brahe

Nationality: Danish

Contribution: improved observational methods; used triangulation in 1589 to determine distance to island.

1700 AD

Name : Newton

Nationality: British

Contribution: theory of gravitation; predicted Earth should be oblate

1800 AD

Name : Foucault

Nationality: French

Contribution: gyroscope; pendulum; demonstrated Earth spins on axis.

1900 AD

Name : Einstein

Nationality: German

Contribution: General Theory of Relativity; concept of gravity as the geometry of space-time

2. Provide a brief description of each of the following international geodetic organizations. At a minimum, include their website and why they are important. [8 points]

### International Federation of Surveyors(FIG)

This international organization was established in 1878 with the aim to ensure that surveying disciplines and all those associated with surveying meet the needs of the markets and communities. This organization represents the interest of worldwide surveyors which provides an international forum for discussion and professional development. Currently, it represents more than 120 countries

The vision of FIG is “ A modern and sustainable surveying profession in support of society, environment and economy by providing innovative, reliable and best practice solutions to our rapidly changing and complex world, acting with integrity and confidence about the usefulness of surveying, and translating these words into action.”

Website: [www. fig. net](http://www.fig.net)

### International Union of Geodesy and Geophysics(IUGG)

This international organization is dedicated to the promotion and coordination of scientific studies of earth which includes physical, chemical and mathematics study and its environment in space which includes shape, dynamics, gravity, and magnetic fields, tectonic and earthquakes etc. It was established in 1919 and is one of the 32 scientific union within International Council for Science.

Website: [http://www. iugg. org](http://www.iugg.org)

### International Association of Geodesy(IAG)

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This promotes scientific cooperation and research in geodesy on a global scale. It is one of the active member of IUGG which is one of the 32 scientific union within international council for science. The mission of the Association is the advancement of geodesy.

Website: <http://www.iag-aig.org>

International Earth Rotation and Reference Systems and Reference Systems Service (IERS)

This international organization was established in 1987 by the international Astronomical union and the international union of Geodesy and geophysics. It was renamed to International Earth Rotation and Reference Systems Service in 2003. The objectives of the IERS are to serve astronomical, geodetic, and geophysical communities by providing standards, constants and models, geophysical data to interpret time /space variation, earth orientation parameters required to study earth orientation variation, and international Celestial Reference System and international Terrestrial reference system.

Website: <https://www.iers.org>

3. Read an article from a geodesy journal that you find interesting and provide a one to two paragraph summary of the article including a proper reference and citations. Upload a PDF of the original article to the assignment #1 drop box. [24 points]

The recent discoveries of many other earth like exoplanets have raised a question about Earth being only living planet in the universe. Are there any

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other planets which are suitable for life to start? The requirement of life on any planet is water. Living organism cannot exist without water. Pressure and temperature on the planet should be in a specific range to get the liquid water. Pressure must be significantly higher and the temperature should be between freezing and boiling point. This condition is much more impossible in other existing planets or yet to be discovered. Various classes of habitable planets are classified where class I habitats represents Earth like planet where stellar and geophysical conditions allow water and sunlight to be available. Class II habitats do not have ability to sustain liquid water on their surface due to geophysical conditions, e. g. Mars and Venus. Class III habitats are planet where water exists below the surface which interact directly with silicate-rich core. The interaction of silicate and hydrothermal activities are assumed to be very important for the origin of life in such planets, e. g. Europa and one of Jupiter's satellites. And class IV habitats are very rich in water with oceans lying above a solid ice layer. The oceans are thought to be enclosed between ice layers where the possibility of life is very thin. The other condition to be a habitable planet is being at the right distance from a star and having the right atmosphere. It must have an atmosphere which keeps the pressure and temperature in the right range. However, the experience of mankind is not yet sufficient to estimate the nature and habitual conditions of many others planets. The Earth, in the other hand has a combination of favorable conditions among other planets for the life. It will be possible in the future to learn more about the exoplanets atmosphere because of the projects like earth-based telescopic observations, the James Webb Space telescope. However, discovering and characterizing the atmosphere of habitable planets will remain challenging.

(Forget, 2013)

#### Reference

Forget, F. (2013, July). On the probability of habitable planets. *International Journal of Astrobiology*, 12 (3), 177-185. doi: <https://doi.org/10.1017/S1473550413000128>

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