IIT GUWAHATI MATHEMATICS SEMINAR SERIES presents

a talk by

Prof. G P Raja Sekhar, Department of Mathematics, Indian Institute of Technology Kharagpur

as part of Lagrange Day celebration.

The Journey of Lagrange and Applications of Euler-Lagrange Equations in Fluid Mechanics.

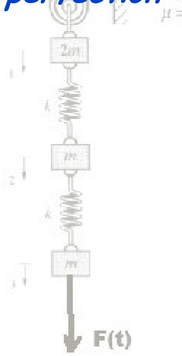
"As long as algebra and geometry have been separated, their progress have been slow and their uses limited; but when these two sciences have been united, they have lent each mutual forces, and have marched together towards perfection"

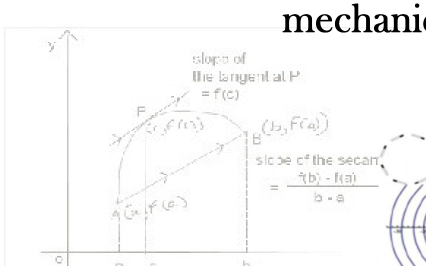
Joseph-Louis Lagrange (25 January 1736 – 10 April 1813), was an Italian enlightenment era mathematician and astronomer. He made significant contributions to the fields of analysis, number theory, and both classical and celestial mechanics.

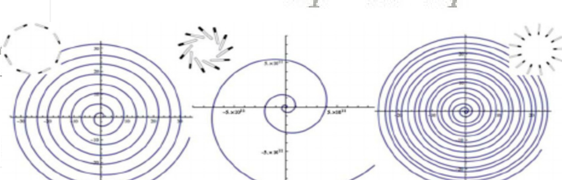
Lagrange was one of the creators of the calculus of variations, deriving the Euler–Lagrange equations for extrema of functionals. He also extended the method to take into account possible constraints, arriving at the method of Lagrange multipliers and invented the method of solving differential equations known as variation of parameters. He proved that every natural number is a sum of four squares. In calculus, Lagrange developed a novel approach to interpolation and Taylor series. He studied the three-body problem for the Earth, Sun and Moon (1764) and the movement of Jupiter's satellites in 1766 and in 1772 found the special-case solutions to this problem that yield what are now known as Lagrangian points. But above all he is best known for his work on mechanics, where he transformed Newtonian mechanics into a branch of analysis, popularly known as Lagrangian mechanics.

Prof. G. P. Raja Sekhar is a Professor in the Department of Mathematics, IIT Kharagpur. His areas of interest are Boundary integral methods for viscous flows, Hydrodynamic and thermocapillary study of viscous drops, Applications of binary mixture theory to biological tissues. He is a recipient of Alexander Von Humboldt Fellowship, INSA Young Scientist Award, JSPS Fellowship etc.

Venue: Lecture Hall - 4
Date: 25th January 2018
Time: 5:00 PM







$$\frac{\partial L}{\partial q} - \frac{d}{dt}\frac{\partial L}{\partial \dot{q}} = 0$$

$$\nabla f(x,y,z) = \lambda \nabla g(x,y,z) + \mu \nabla h(x,y,z)$$

$$g(x,y,z) = c, \quad h(x,y,z) = k.$$

$$L = \frac{m}{2}\left(\dot{r}^2 + r^2\dot{\theta}^2\right) + \frac{GMm}{r}$$