Geodesy and Geoinformatics

Bachelor of Science
Master of Science

HCU HafenCity Universität Hamburg

COMPUTATIONAL MATHEMATICS

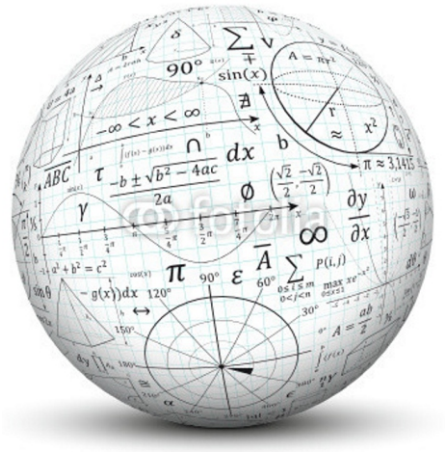
Introduction to the computational mathematics in the geomatic sciences
4th - 6th march 2019

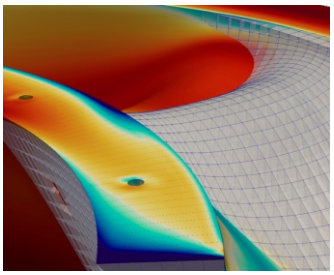
Prof. Dr. Thomas Schramm, HafenCity University Hamburg

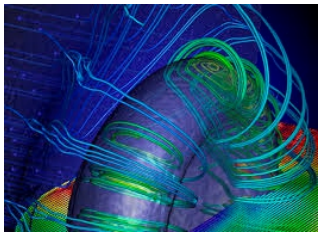
Using computer algebra systems as Maple, gives the possibility to join numerical and symbolical methods to solve geodetic problems. In our lecture, we give a very brief introduction to the maple system and apply it to some selected typical problems.

Schedule (Aula -114)

Monday	4th march 2019	15:30 - 19:30
Tuesday	5th march 2019	15:30 - 17:30
Wednesday	6th march 2019	15:30 - 17:30





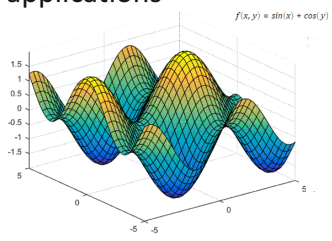


TOPICS

Solving a system of non-linear equations
This problem occurs naturally if a location is computed as the intersection of circles or spheres (GPS, hidden point). We show that the iterative Newton method is not the only choice. Using the resultant or Groebner basis approach for polynomial systems we can find a closed solution.

Formulating and solving differential equations
These occur directly or in discretized version in the modern filter theory e.g. in Kalman-filters as inbuilt in GPS sensors or tracking systems.

Examples and applications



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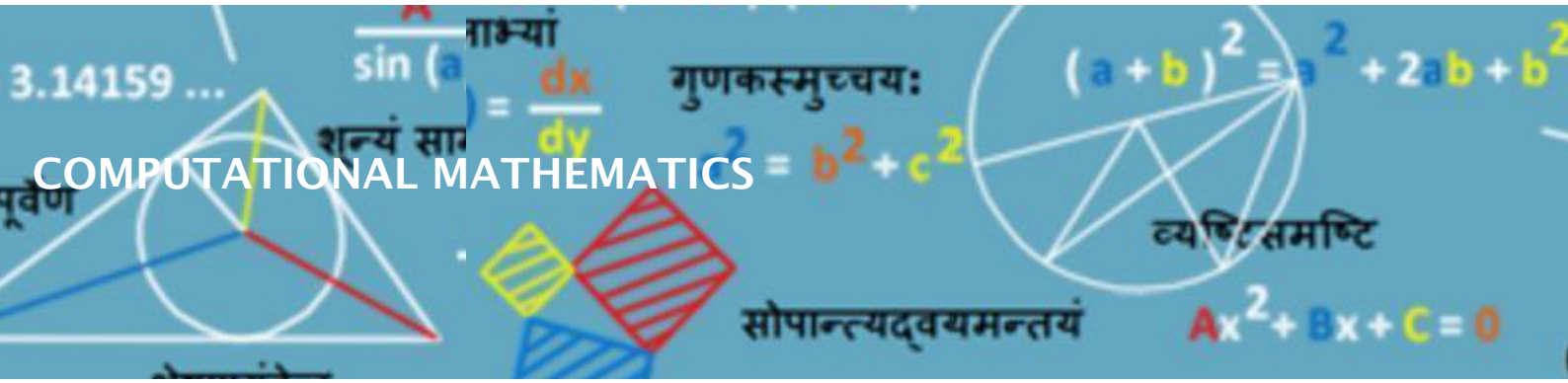

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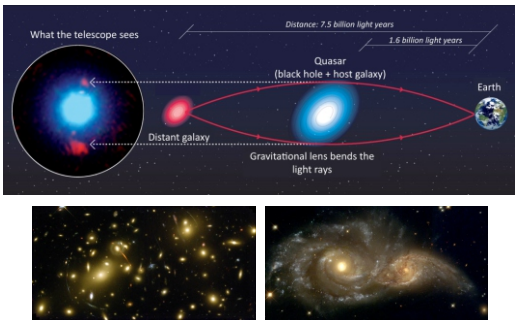
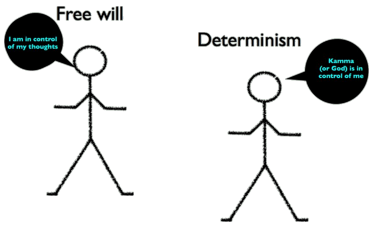
Small Talks in Science

- Gravitational Lenses



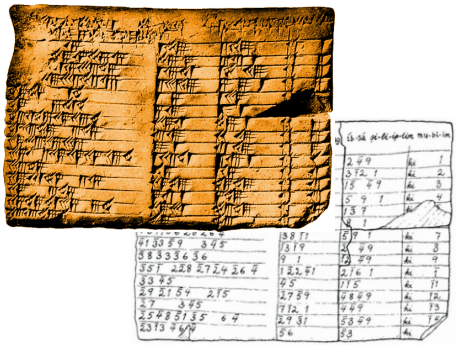
- Determinism

- Free Will



Talks

- Who invented it?
  The development of Trigonometry
  (Babylon PlImpton#322)



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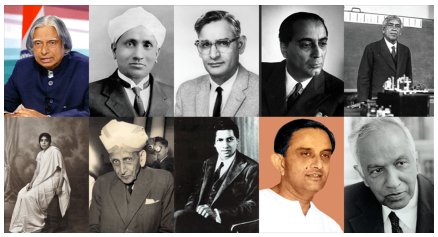
India's contributions
to mathematics and physics



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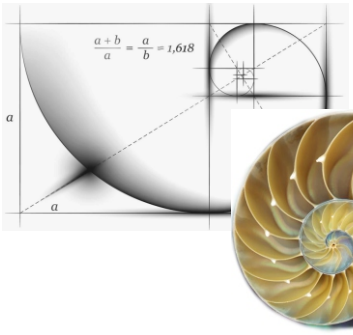
Divine Proportions:
A new approach to an universal geometry



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