

Schedule of MATH 5770 (Spring 2009)
Introduction to Celestial Mechanics

Topics to be covered by Kuo-Chang Chen (2/25 ~ 4/17) include:

1. Elementary principles and examples
 2. Integrals of motions
 3. Conservative force fields
 4. Central force fields
 5. The Kepler problem
 6. Invariants of the three-body problem*
 7. The restricted three-body problem
 8. Self-similar or homographic solutions
 9. Calculus of variations
 10. Lagrange's equations
 11. Legendre transformations
 12. Hamilton's equations
 13. Liouville's theorem
 14. Minimizing properties of Keplerian orbits*
- (* if time permits)

Topics to be covered by Alain Albouy (4/22 ~ 6/19) include symmetry and Noether's theorem, central configurations, $SO(4)$ symmetry of the Kepler problem, etc. Details are to be announced. Alain has prepared a lecture note on the two-body problem available at <http://www.math.nthu.edu.tw/~kchen/teaching/NewtonBernoulli.pdf>

On the week of 5/20 Alain Albouy will give a short lecture series on central configurations. The lecture on 5/22 is embedded into the 2009 CTS Workshop on Dynamical Systems from 5/21-5/24. There will be other research-oriented lectures on celestial mechanics during the workshop. All of you are encouraged to attend those lectures.