Triple star systems

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Equations to solve

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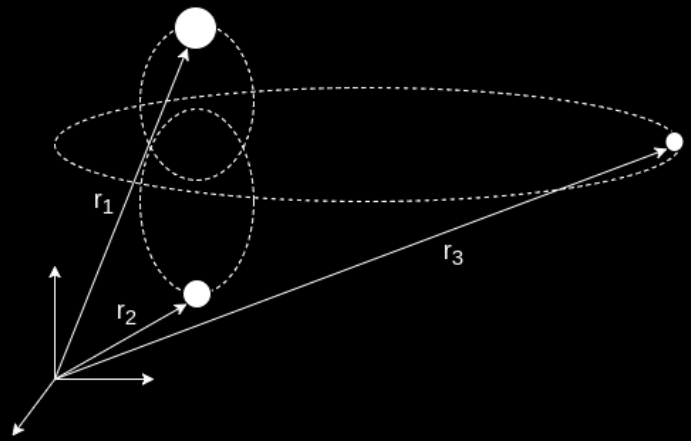
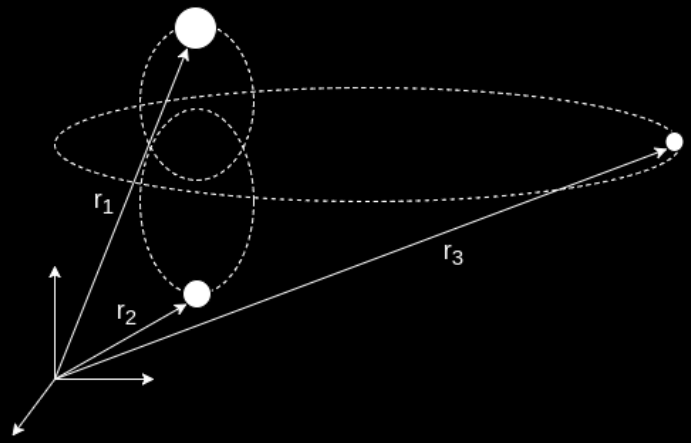


Using Newton's law:

Equations to solve



Using Newton's law:

- $m_1\ddot{\mathbf{r}}_\mathbf{1} = -Gm_1m_2\frac{\mathbf{r_2}-\mathbf{r_1}}{|\mathbf{r_2}-\mathbf{r_1}|^3} - Gm_1m_3\frac{\mathbf{r_3}-\mathbf{r_1}}{|\mathbf{r_3}-\mathbf{r_1}|^3}$
- $m_2\ddot{\mathbf{r}}_\mathbf{2} = Gm_1m_2\frac{\mathbf{r_2}-\mathbf{r_1}}{|\mathbf{r_2}-\mathbf{r_1}|^3} - Gm_2m_3\frac{\mathbf{r_3}-\mathbf{r_2}}{|\mathbf{r_3}-\mathbf{r_2}|^3}$
- $m_3\ddot{\mathbf{r}}_\mathbf{3} = Gm_1m_3\frac{\mathbf{r_3}-\mathbf{r_1}}{|\mathbf{r_3}-\mathbf{r_1}|^3} + Gm_2m_3\frac{\mathbf{r_3}-\mathbf{r_2}}{|\mathbf{r_3}-\mathbf{r_2}|^3}$

Project

Algorithm:

Initial Conditions $\rightarrow$

Project

Algorithm:

$\boxed{\text{Initial Conditions}} \rightarrow \boxed{\text{Verlet Algorithm}} \rightarrow$

Project

Algorithm:

$$\boxed{\text{Initial Conditions}} \rightarrow \boxed{\text{Verlet Algorithm}} \rightarrow \boxed{\text{Trajectories}}$$

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Stability Analysis:

Project

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Stability Analysis:

- Explore phase-space of 21 parameters to find stable orbits: no body escapes the system.

Project

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- Make outer semi-major axis smaller until the stability breaks.

Project

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- Make a code to calculate Kinetic Energy, Potential Energy, Angular Momentum and semi-major axis to study stability as a function of them.

Project

Algorithm:

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- Make a code to calculate Kinetic Energy, Potential Energy, Angular Momentum and semi-major axis to study stability as a function of them.
- If I have time, try to simulate one known triple system: Burgasser+ 2012.