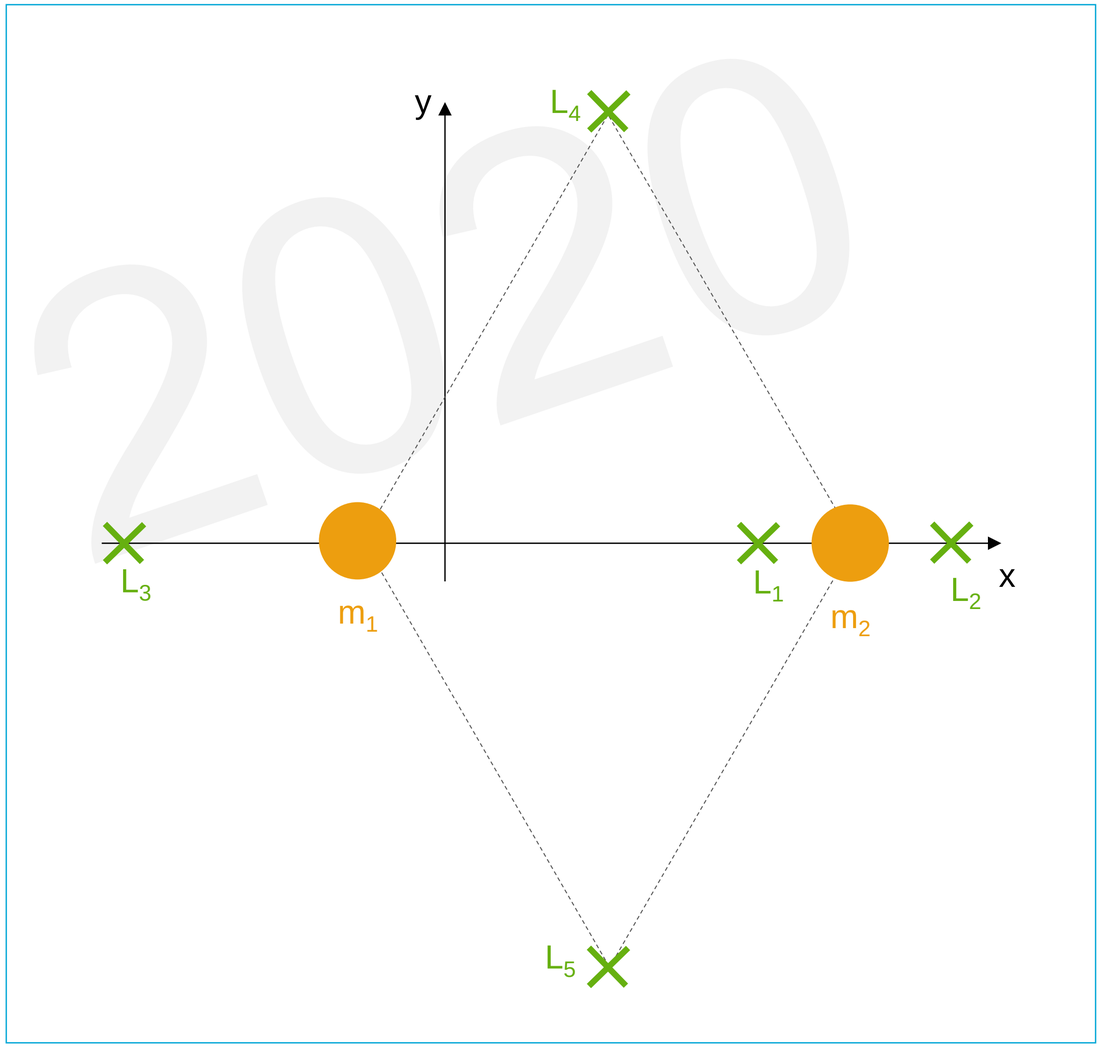
Heteroclinic connections

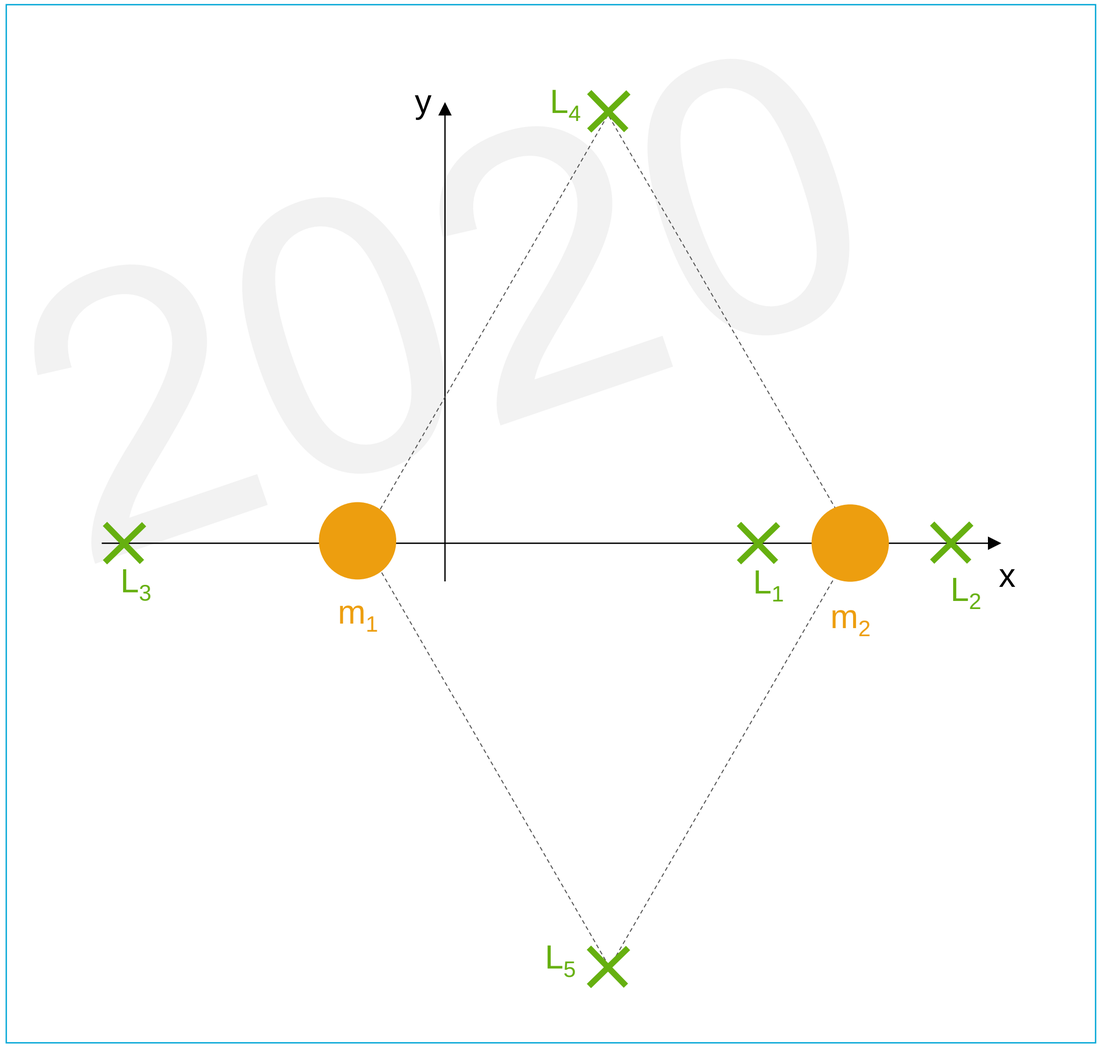
Heteroclinic connnection

- Connection between two different Lagrange points



Heteroclinic connnection

- Connection between two different Lagrange points
- Exploit the unstable and stable manifolds of the different Lagrange points



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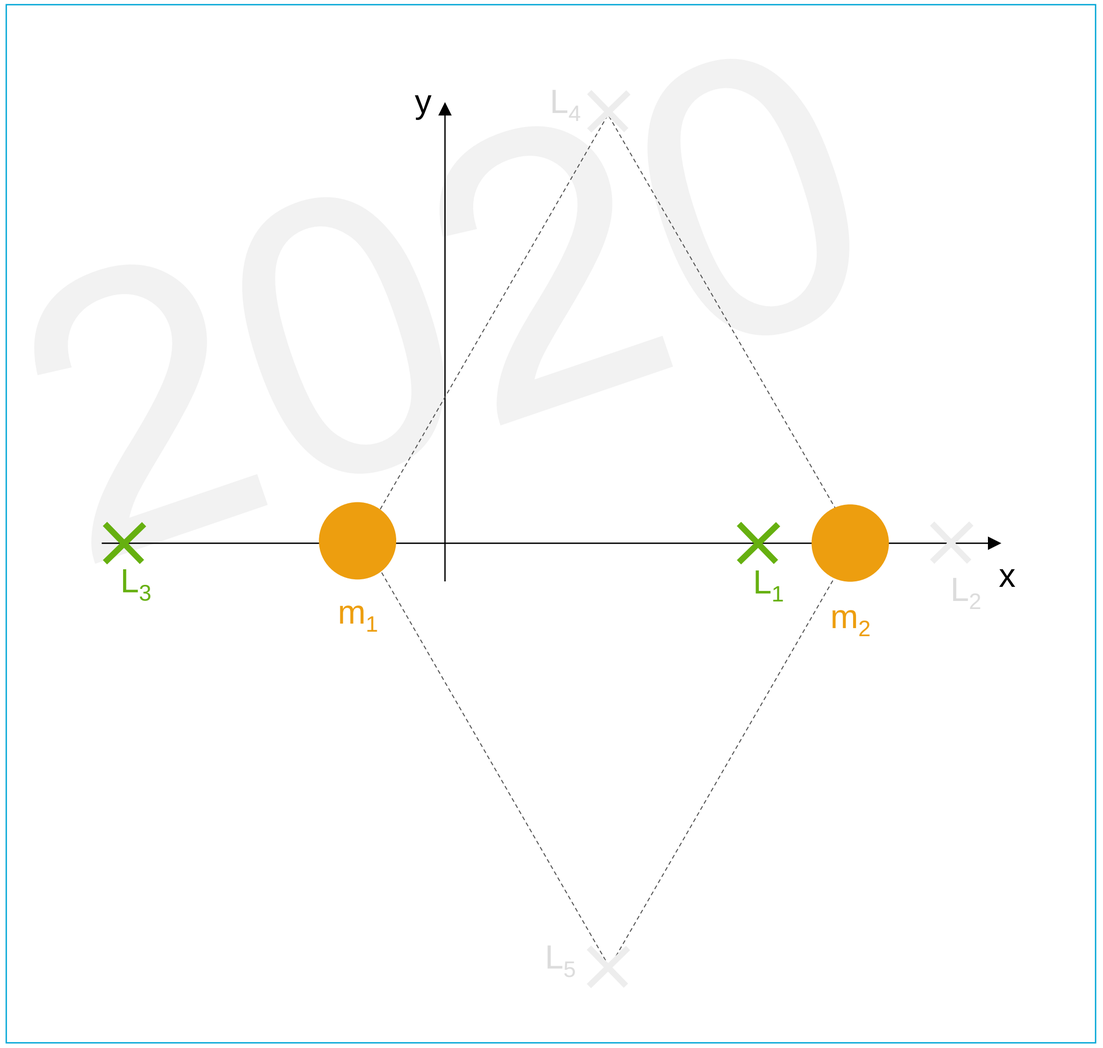

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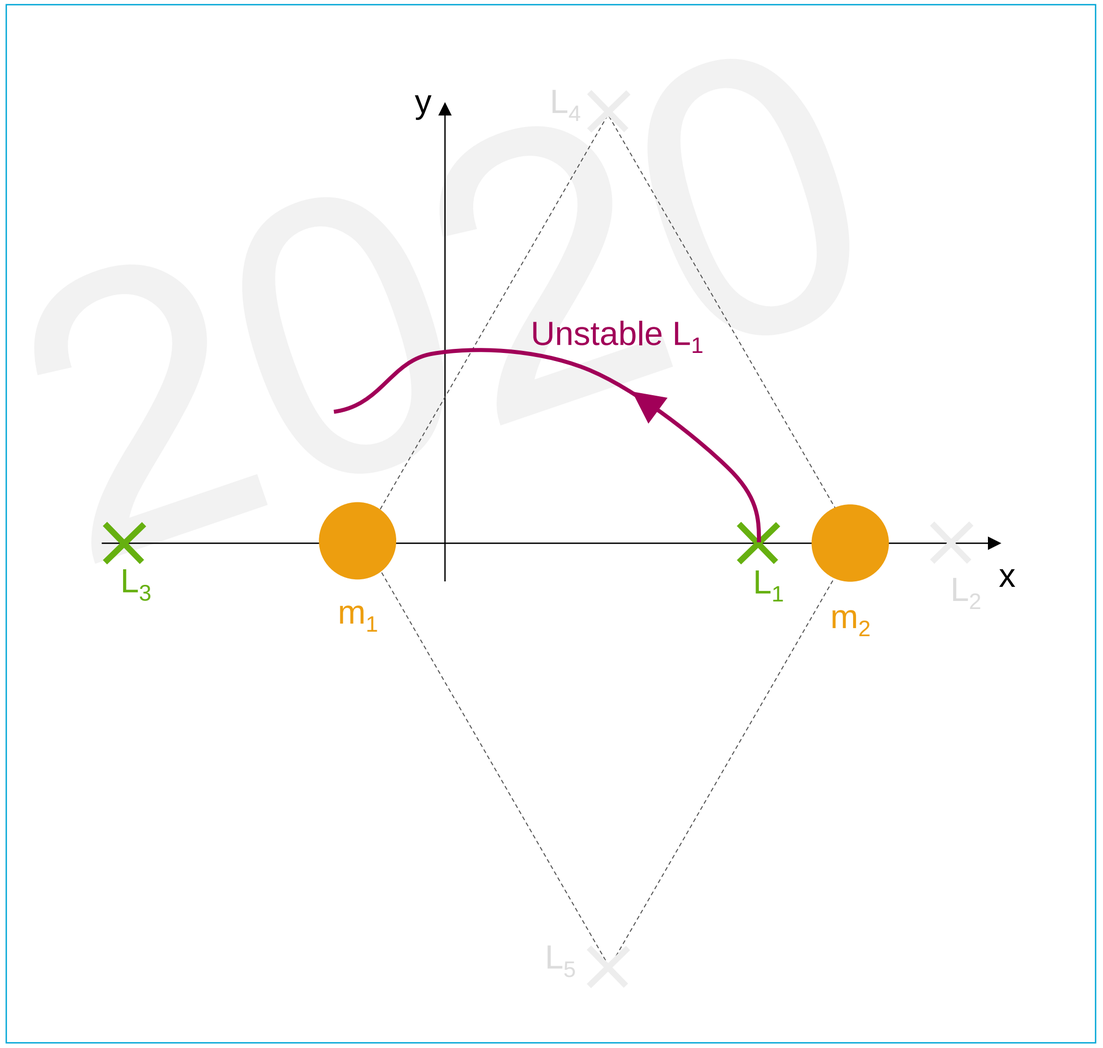

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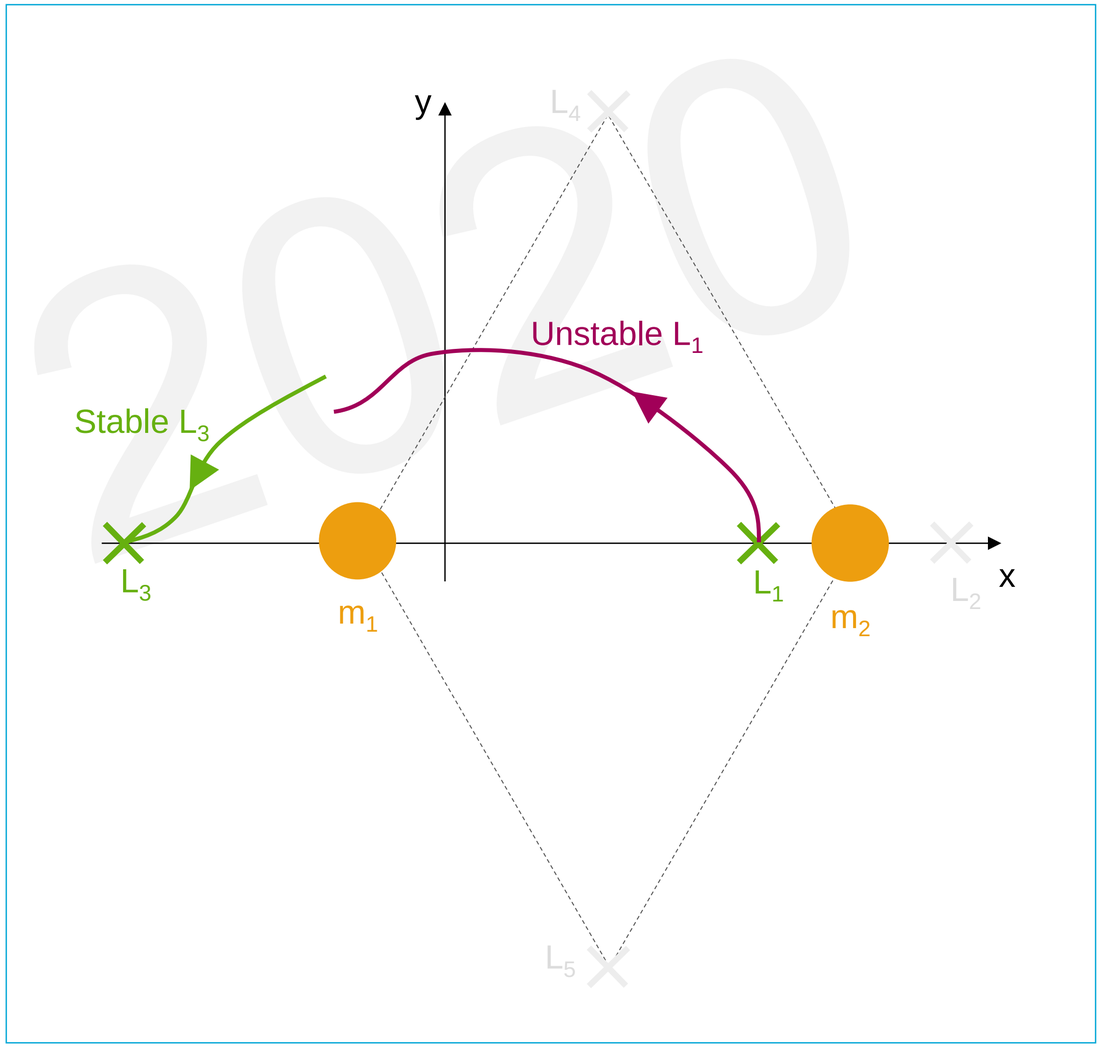

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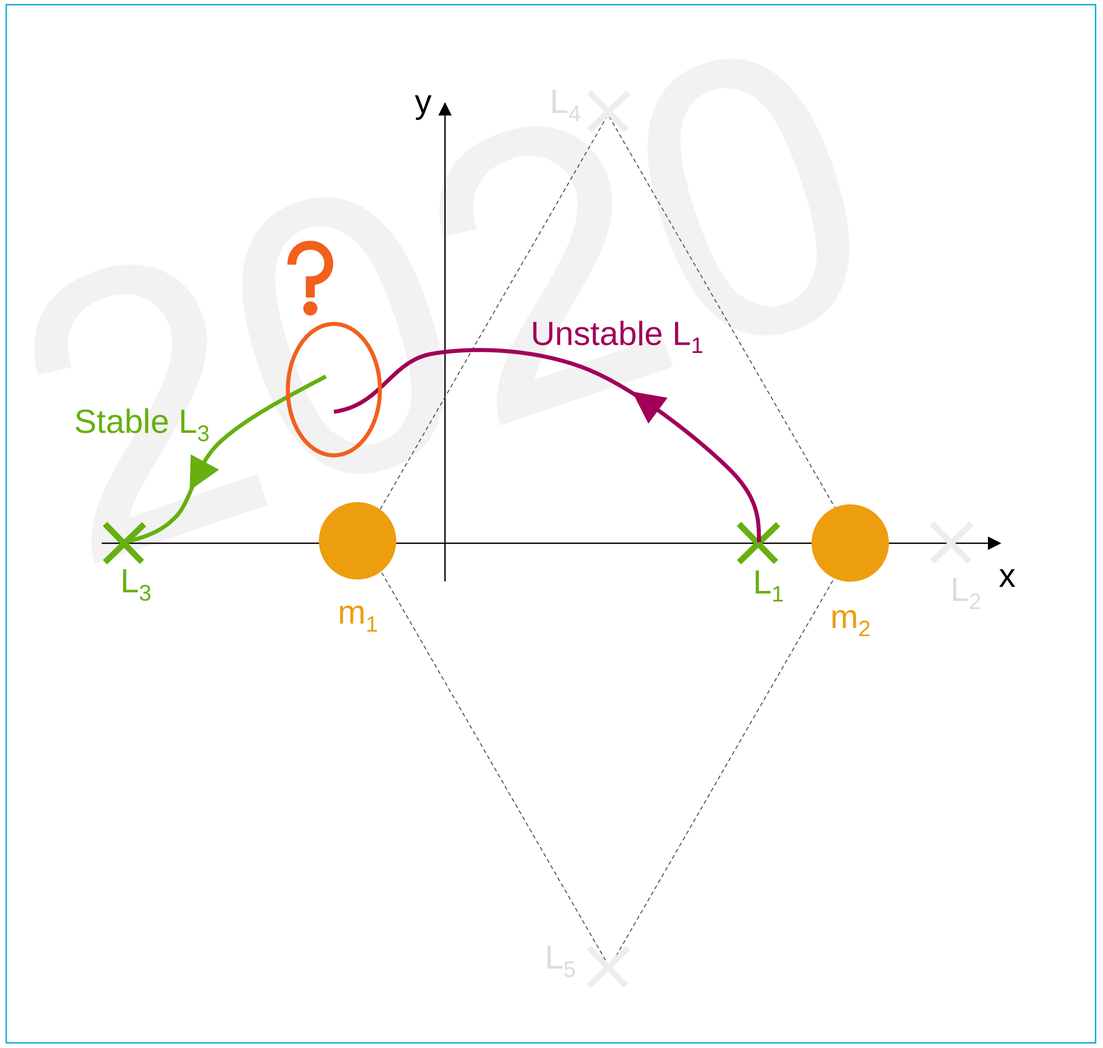

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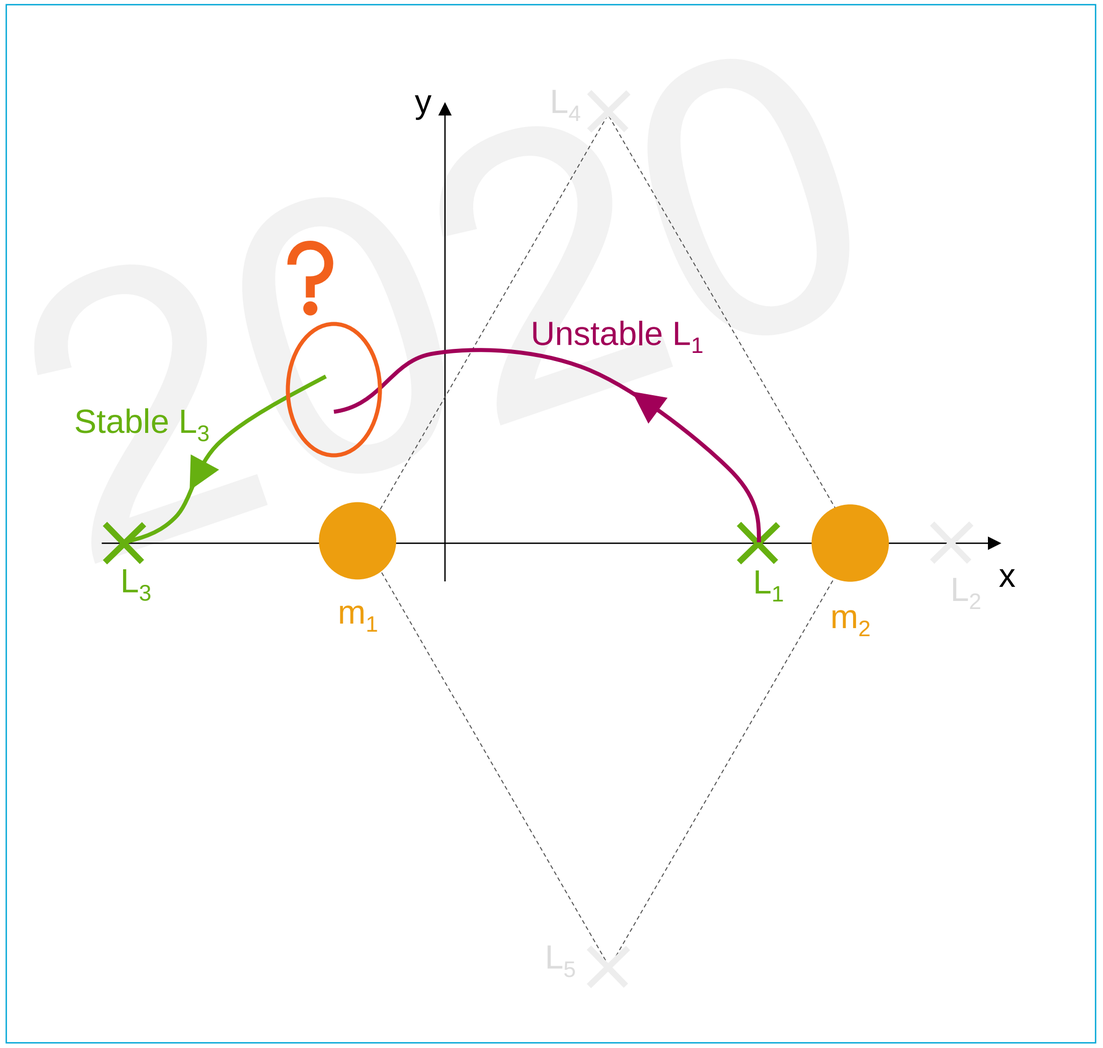
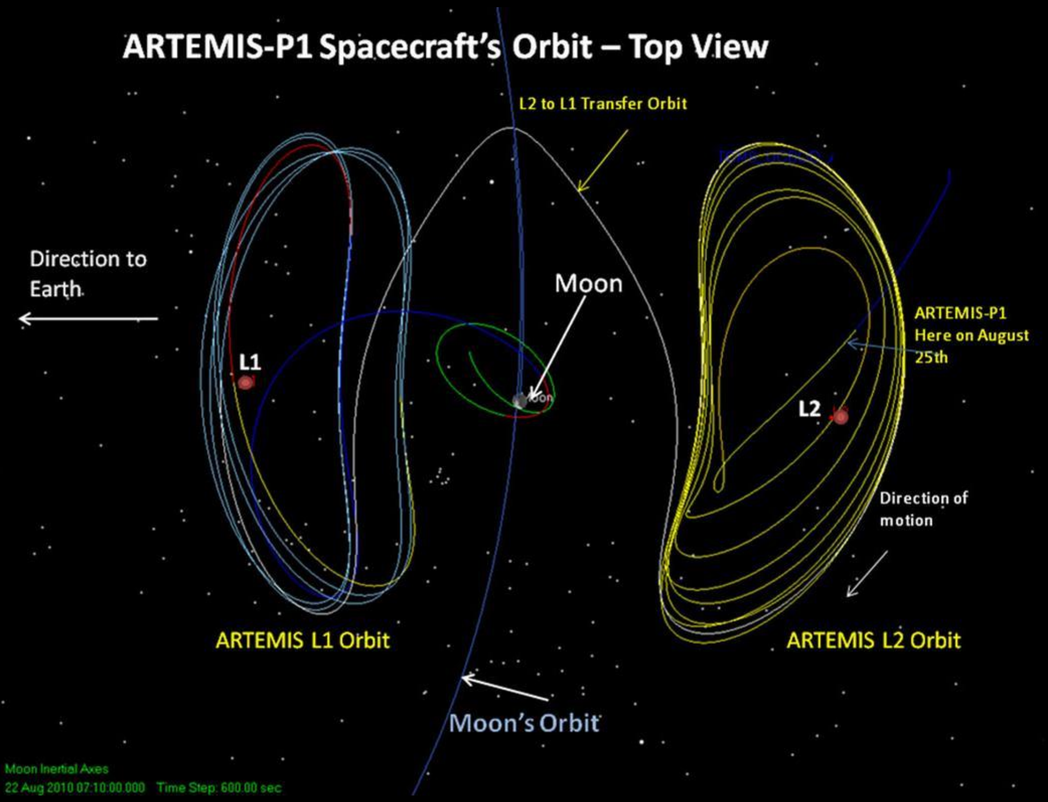


Heteroclinic connnection - utility

2010-08-01 00:00 THEMIS-B



0.000km/s 1,121,289km

Heteroclinic connnection - utility

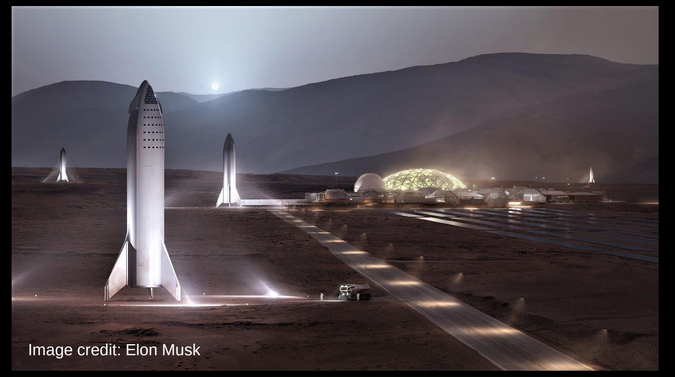
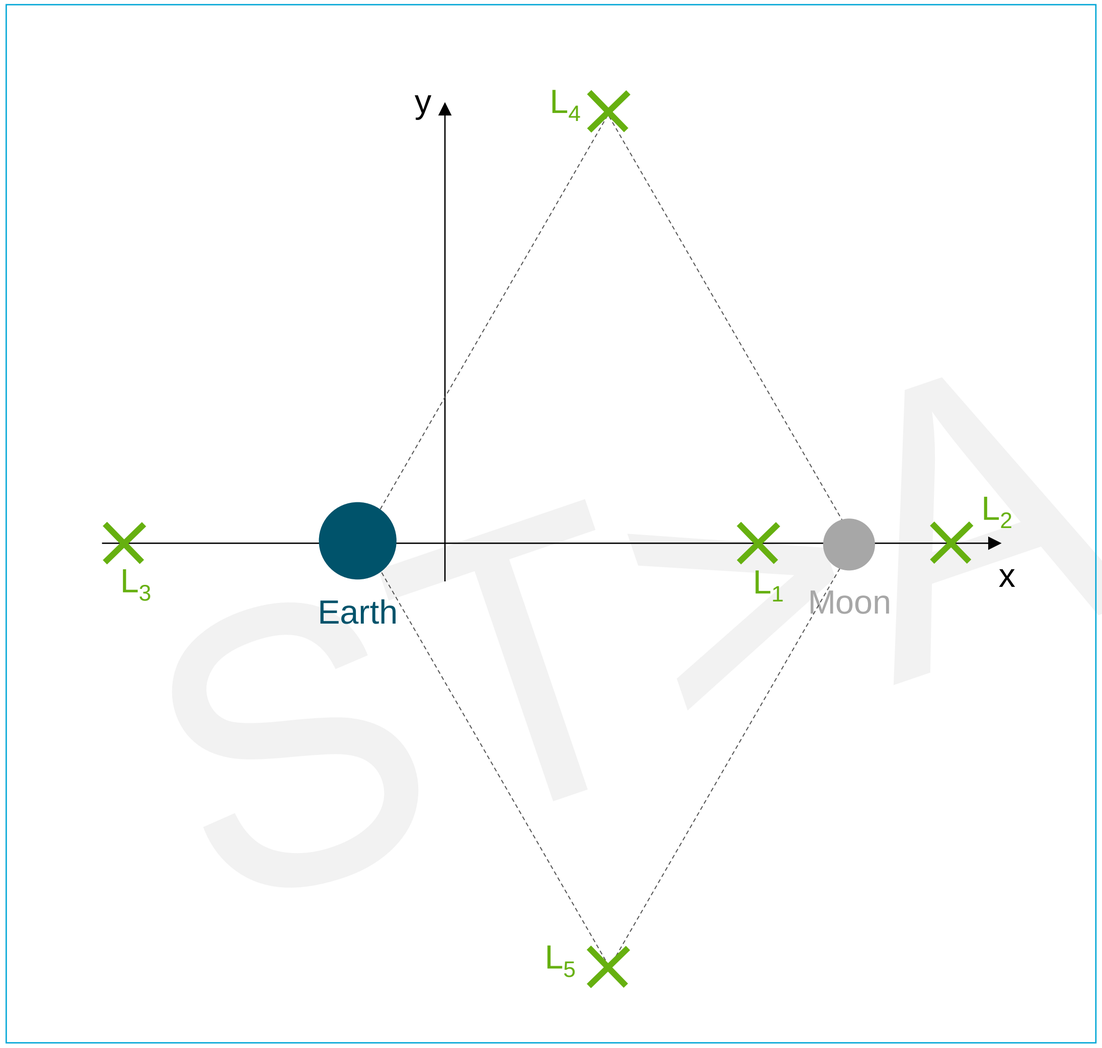


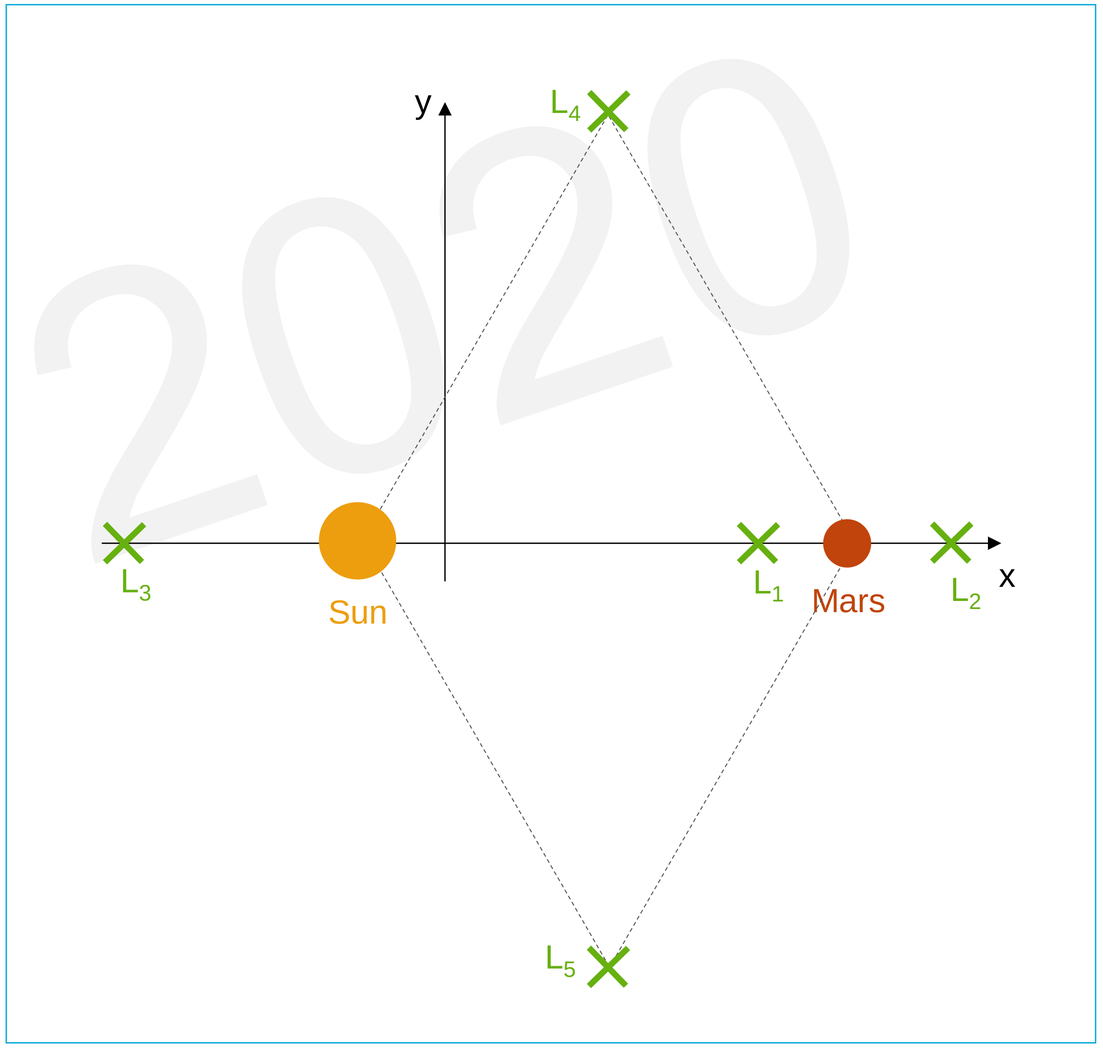
Image credit: Elon Musk


Image credit: Mars One

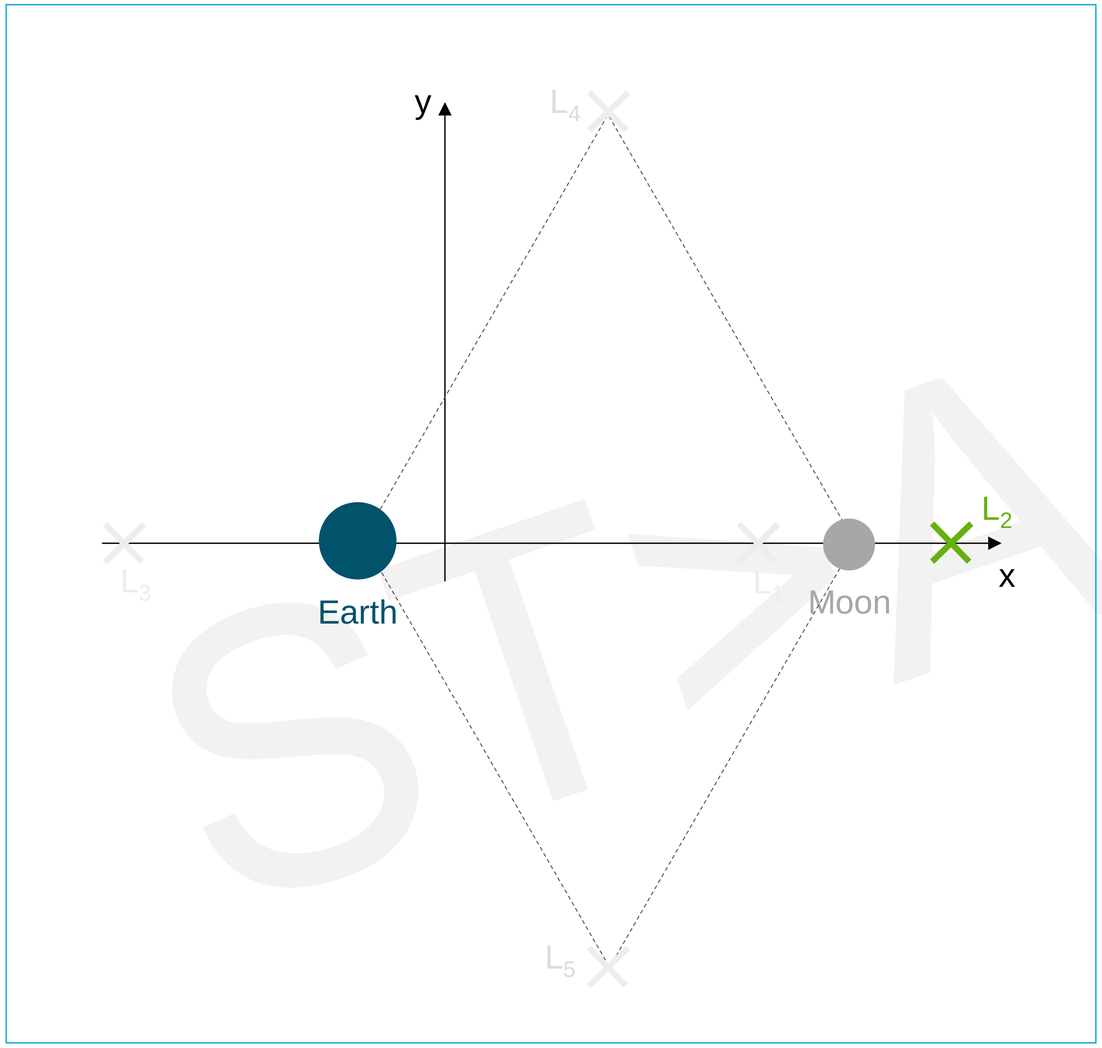

Image credit: National Geographic

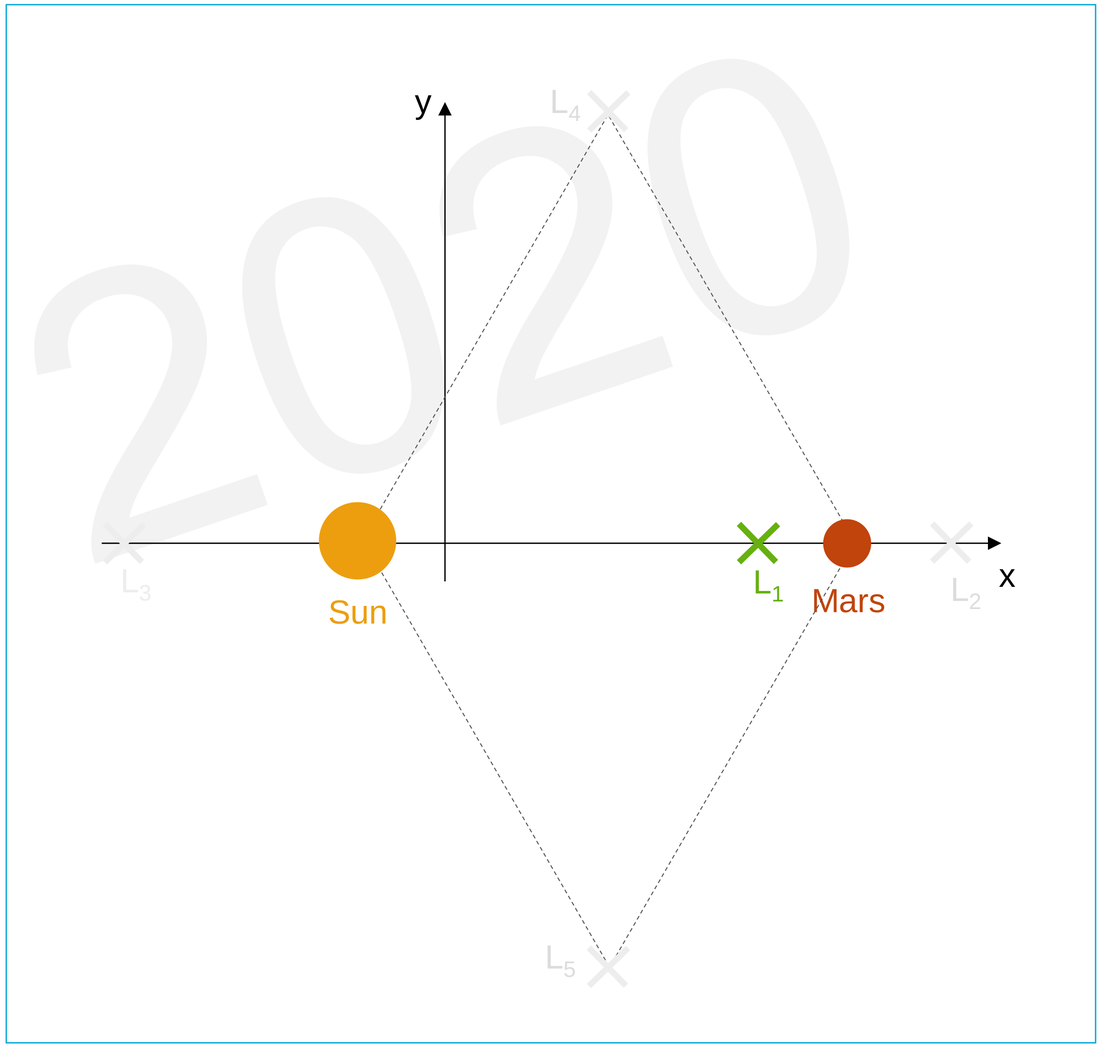
Heteroclinic connnection - utility



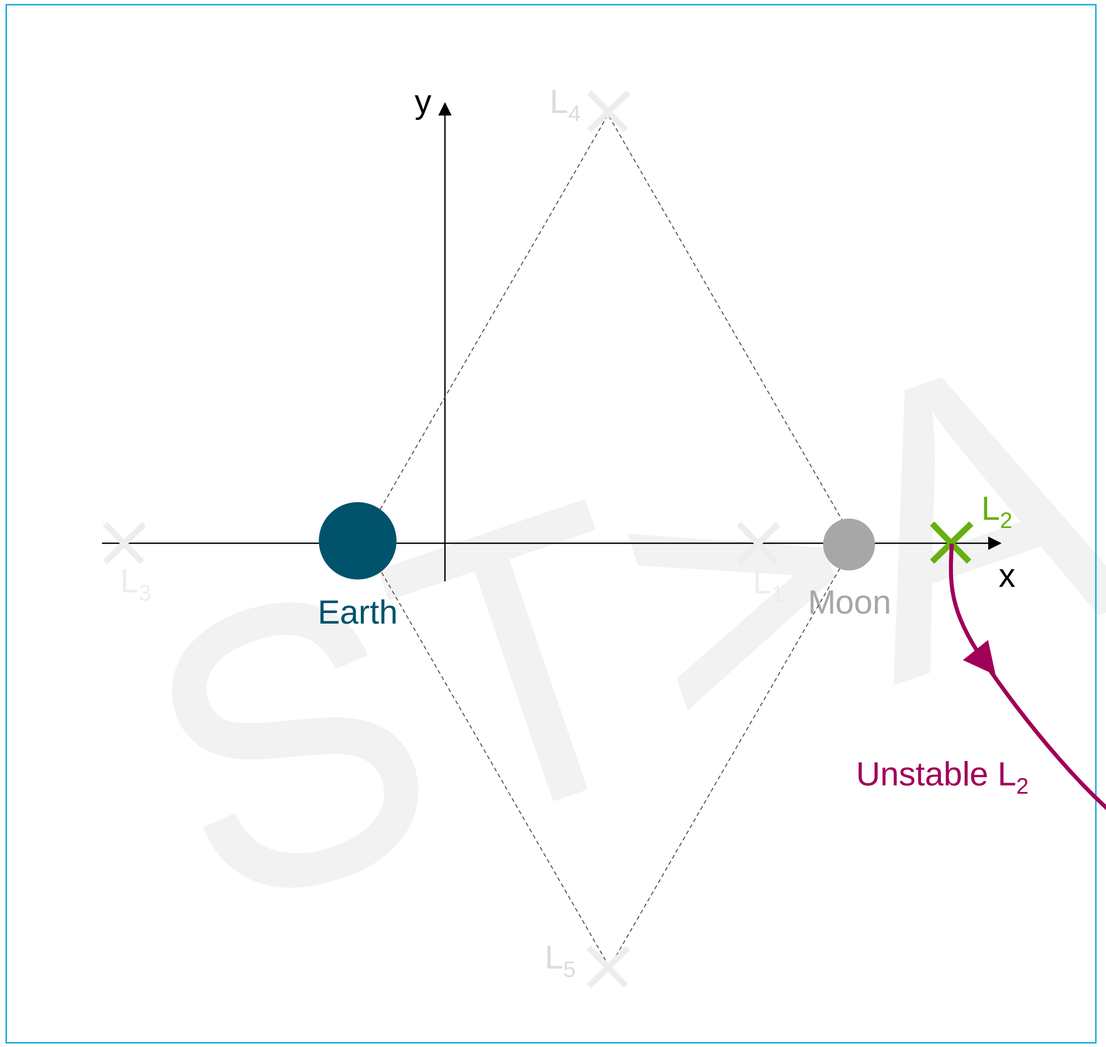


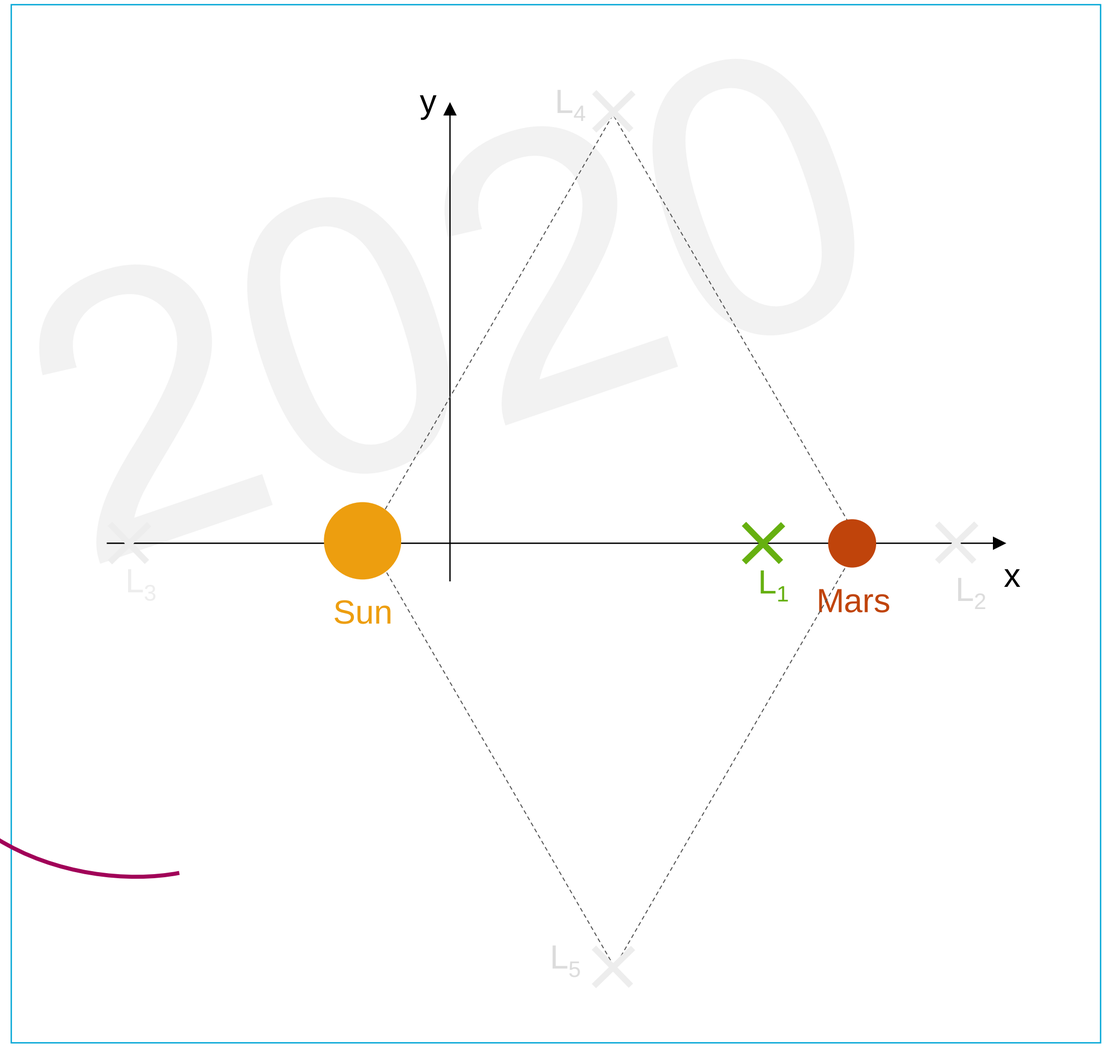
Heteroclinic connnection - utility



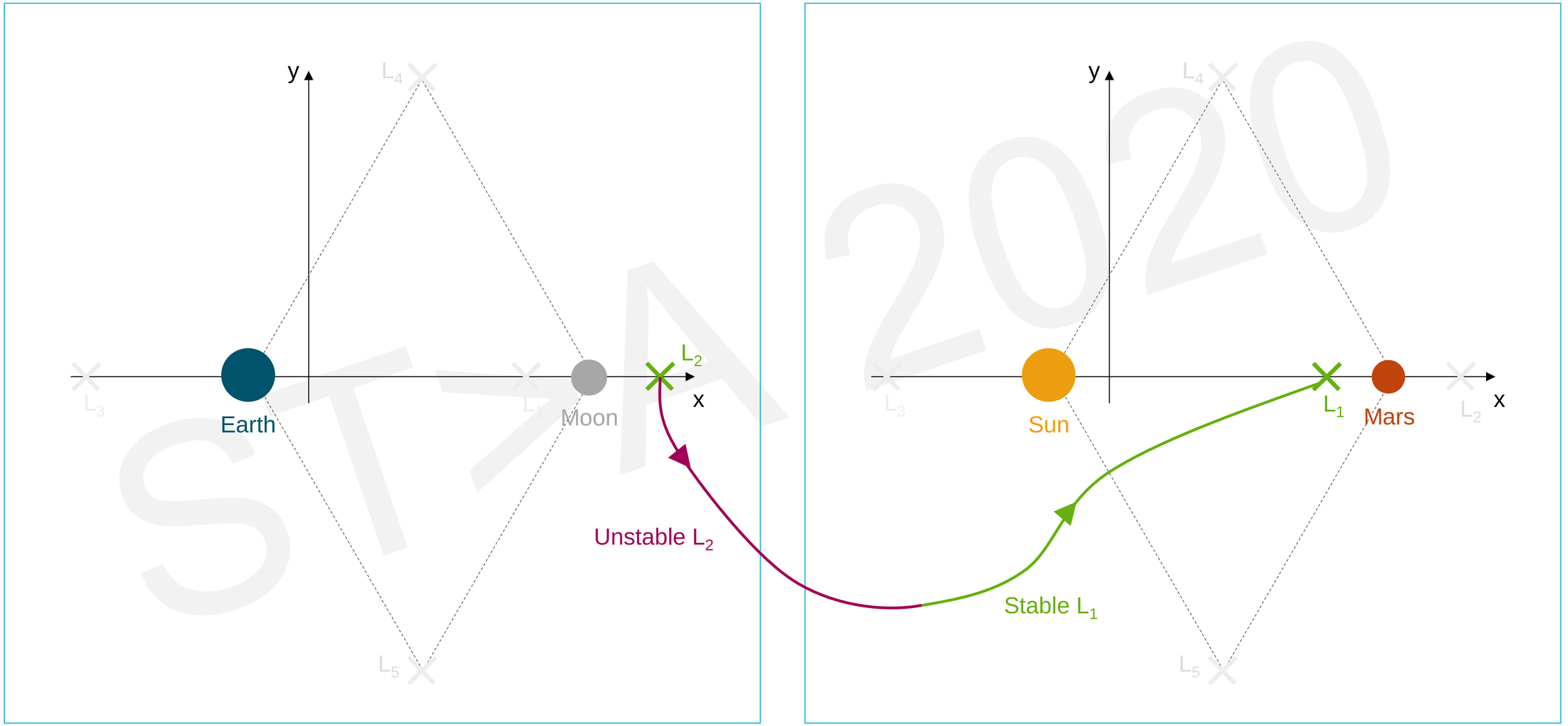


Heteroclinic connnection - utility





Heteroclinic connnection - utility



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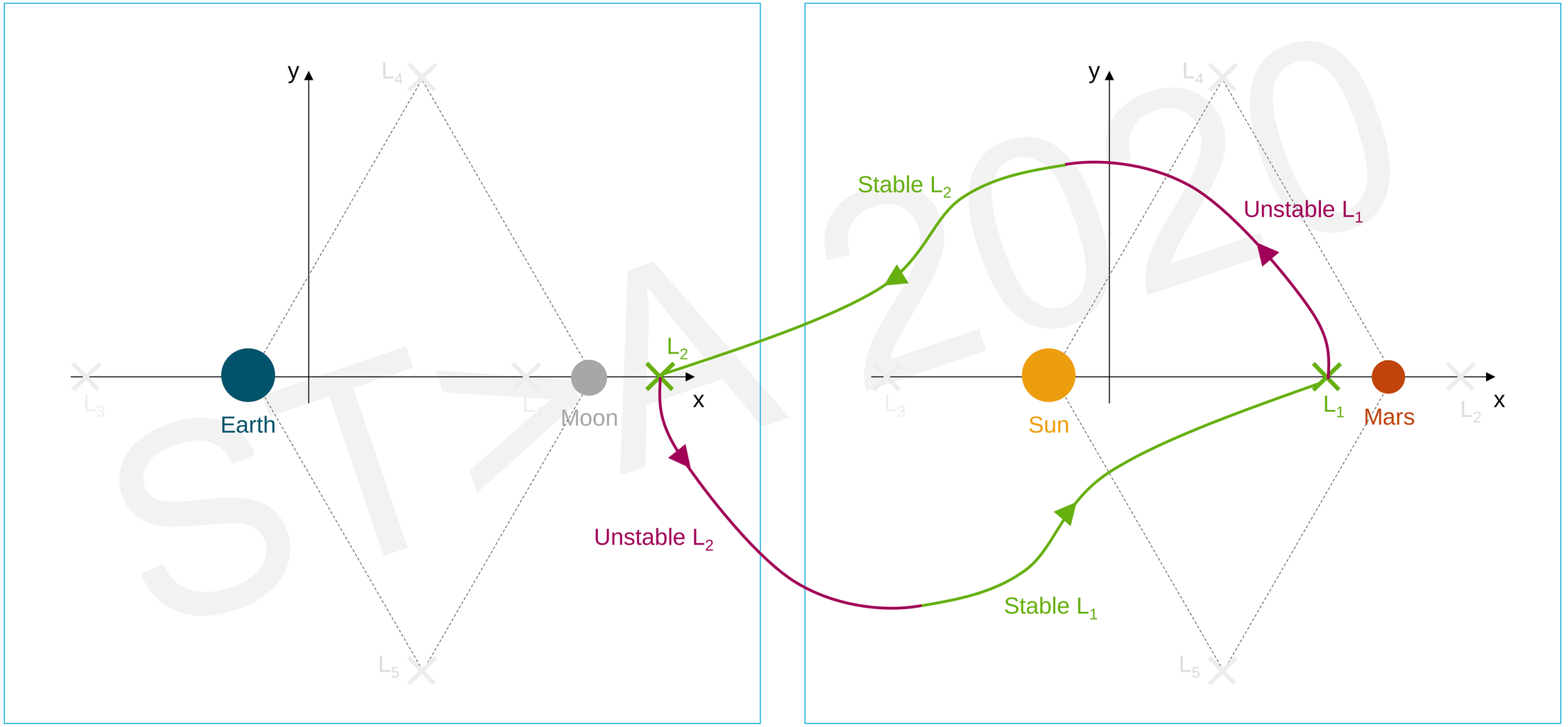

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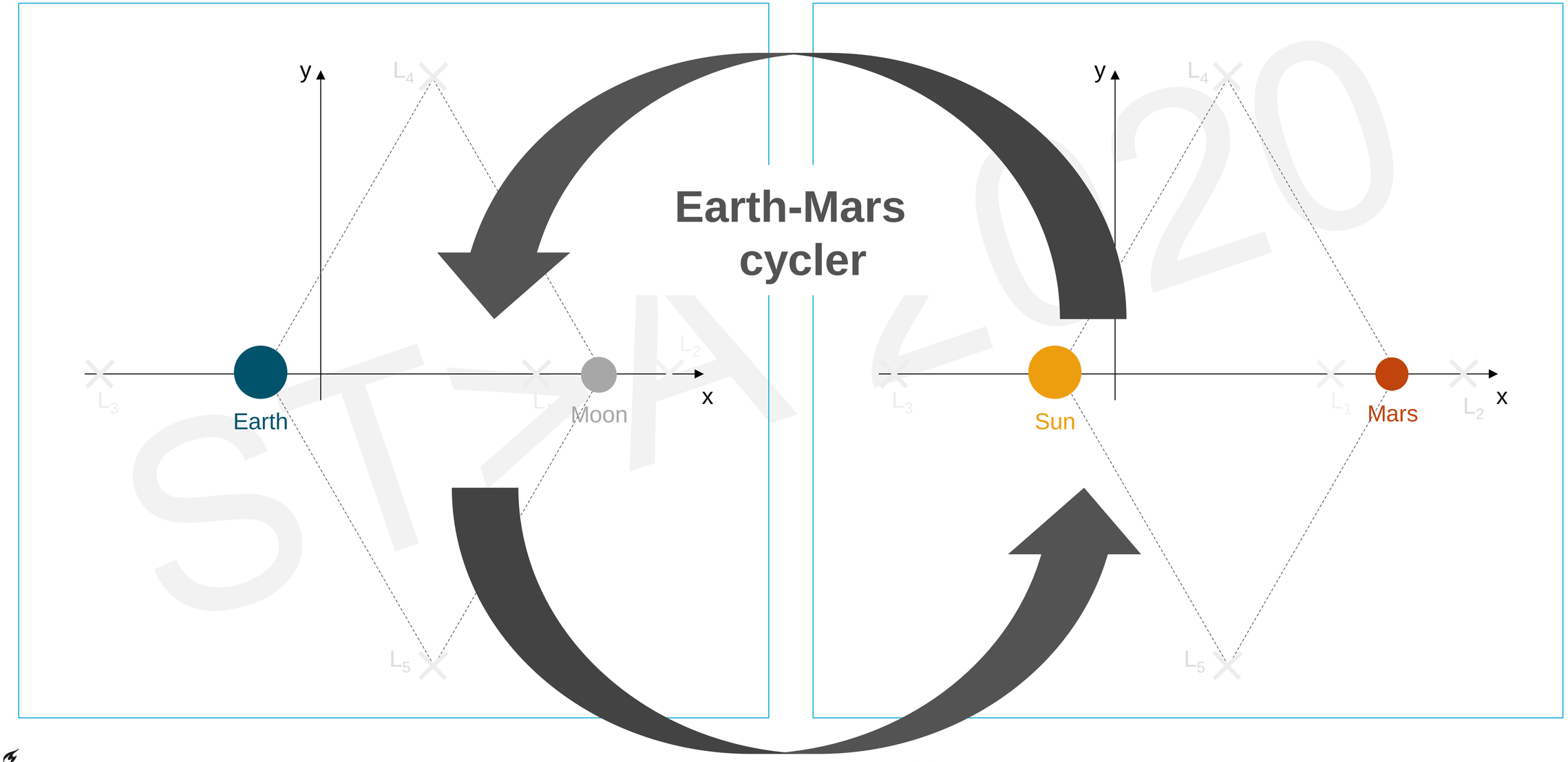

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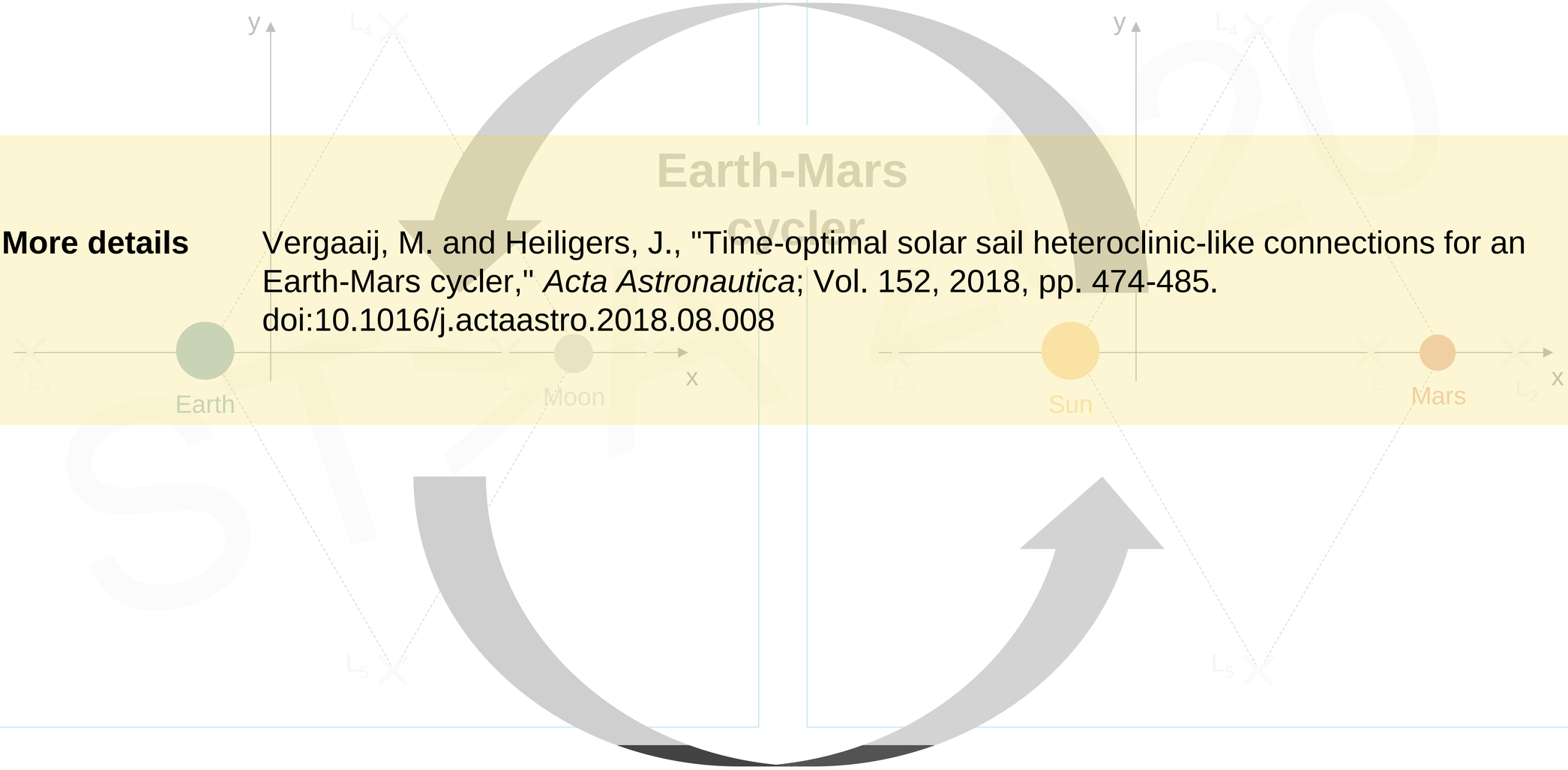
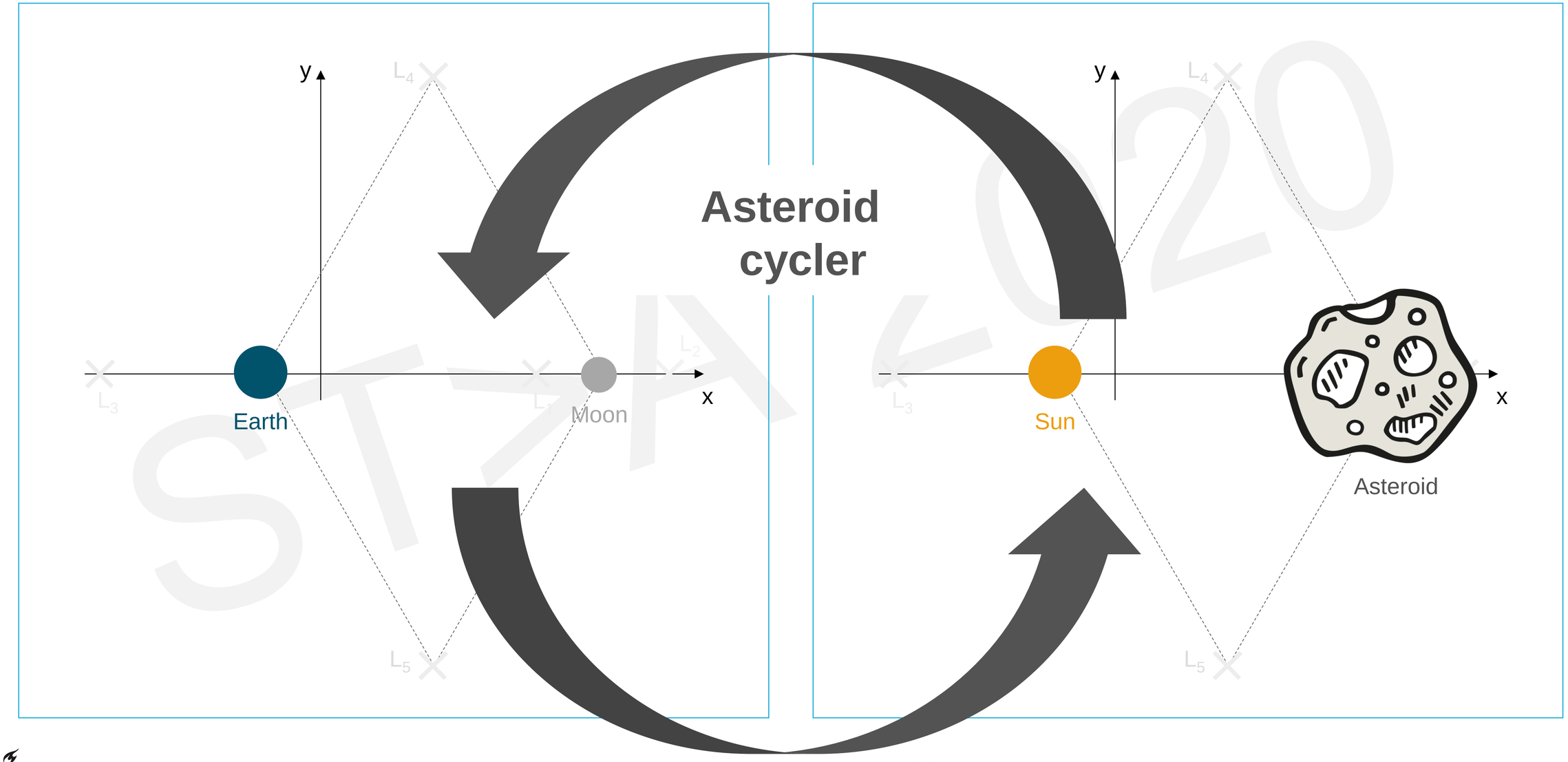


More details Vergaaij, M. and Heiligers, J., "Time-optimal solar sail heteroclinic-like connections for an Earth-Mars cycler," *Acta Astronautica*; Vol. 152, 2018, pp. 474-485. doi:10.1016/j.actaastro.2018.08.008

Heteroclinic connnection - utility



ST>A – Learning objectives today - revisited

- Derive the equations of motion of the cr3bp
  - in a synodic reference frame
  - in dimensionless form

- Compute the Lagrange points of the cr3bp

- Assess the stability of the Lagrange points

- Compute the (un)stable manifolds originating from the Lagrange points

- Identify mission applications of Lagrange points and their (un)stable manifolds

End of video