# Orbital Mechanics: Examples

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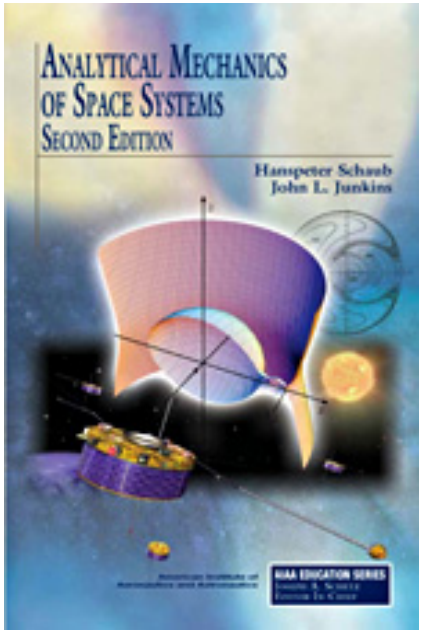
# Overview

# Analytical Mechanics of Space Systems


**hanspeter2003analytical**

# Analytical Mechanics of Space Systems

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# Goldstein's Proof

APPENDIX A

## Proof of Bertrand's Theorem*

The orbit equation under a conservative central force, Eq. (3–34), may be written

$$\frac{d^2u}{d\theta^2} + u = J(u), \tag{A–1}$$

where

$$J(u) = -\frac{m}{l^2}\frac{d}{du}V\left(\frac{1}{u}\right) = -\frac{m}{l^2u^2}f\left(\frac{1}{u}\right). \tag{A–2}$$

The condition for a circular orbit of radius $r_0 = u_0^{-1}$, Eq. (3–41), now takes the form

$$u_0 = J(u_0). \tag{A–3}$$

goldstein2eclassical

# Goldstein Errata

1. Errata report on Herbert Goldstein's Classical Mechanics 2e[1]
2. Errata, corrections and comments on Classical Mechanics, 3e[2]
3. Errors in Goldstein's Classical Mechanics[3]

[1] osti˙6712863
[2] goldstein3errata
[3] tiersten2003errors

# Professional Societies: Computational Mechanics


# Bibliography I

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