CelestialConstants

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Description

All sorts of constants for orbital mechanics purposes

```
fcnPrintQueue(mfilename('fullpath')) % Add this code to code app
```

Earth

```
Earth.name = 'Earth';
Earth.mu = 3.986004415e5; %km3/s2
Earth.R = 6378; %km
Earth.a = 149598023; %km
Earth.spin_rate = 7.2921158553e-05; %rad/s
Earth.flattening = 1/298.25722; %WGS-84
Earth.J2 = 0.0010826267;
Earth.P_days = 365.2421897; %days
Earth.P_years = 0.99997862; %days
```

Moon

```
Moon.name = 'Moon';
Moon.R = 1738.0; %km
Moon.J2 = 0.0002027;
Moon.P_days = 27.321582; %days
Moon.mu = 4902.799; %km3/s2
```

Sun

```
Sun.mu = 1.32712428e11; %km3/s2
```

Mercury

```
Mercury.name = 'Mercury';
Mercury.R = 2439.0; %km
Mercury.J2 = 0.00006;
Mercury.P_days = 87.9666; %days
Mercury.mu = 2.2032e4; %km3/s2
```

Venus

```
Venus.name = 'Venus';
Venus.a = 108208601; %km
Venus.R = 6052.0; %km
Venus.J2 = 0.000027;
Venus.P_days = 224.6906; %days
Venus.mu = 3.257e5; %km3/s2
```

Mars

```
Mars.name = 'Mars';
Mars.a = 227939186; %km
Mars.R = 3397.2; %km
Mars.J2 = 0.001964;
Mars.P_days = 686.9150; %days
Mars.mu = 4.305e4; %km3/s2
```

Jupiter

```
Jupiter.name = 'Jupiter';
Jupiter.a = 778298361; %km
Jupiter.R = 71492; %km
Jupiter.J2 = 0.01475;
Jupiter.P_years = 11.856525; %days
Jupiter.P_days = Jupiter.P_years/Earth.P_years*Earth.P_days; %days
Jupiter.mu = 1.268e8; %km3/s2
```

Saturn

```
Saturn.name = 'Saturn';
Saturn.R = 60268; %km
Saturn.J2 = 0.01645;
Saturn.P_years = 29.423519; %days
Saturn.P_days = Saturn.P_years/Earth.P_years*Earth.P_days; %days
Saturn.mu = 3.794e7; %km3/s2
```

Uranus

```
Uranus.name = 'Uranus';
Uranus.R = 25559; %km
```

```
Uranus.J2 = 0.012;
Uranus.P_years = 83.747406; %days
Uranus.P_days = Uranus.P_years/Earth.P_years*Earth.P_days; %days
Uranus.mu = 5.794e6; %km3/s2
```

Neptune

```
Neptune.name = 'Neptune';
Neptune.R = 24764; %km
Neptune.J2 = 0.004;
Neptune.P_years = 163.7232045; %days
Neptune.P_days = Neptune.P_years/Earth.P_years*Earth.P_days; %days
Neptune.mu = 6.809e6; %km3/s2
```

Celestial units

```
au2km = 149597870.7;
```

Physical constants

```
day2sec = 86400; % sec/day
```

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