

---

```

times = linspace(cspice_str2et('Oct 23, 2026 12:0:0.0'),cspice_str2et('Oct 23,
    2028 12:0:0.0'),562);
[e_state, ~] = cspice_spkezr('EARTH', 846005000, 'ECLIPJ2000', 'NONE', 'SUN');
[m_state, ~] = cspice_spkezr('MARS BARYCENTER',
    870265000, 'ECLIPJ2000', 'NONE', 'SUN');
tof = 870265000-846005000;
[vi_s,vf_s]=glambert(mu, e_state, m_state, tof, 0);

strt = [e_state(1:3);vi_s];

[t,ans] = ode45(@odes, [0 24000000], strt);

earth_positions = [];
mars_positions = [];
for i=1:562
    [earth_pos, ~]= cspice_spkezr('EARTH',
    times(i), 'ECLIPJ2000', 'NONE', 'SUN');
    earth_positions = [earth_positions earth_pos(1:3)];
    [mars_pos, ~] = cspice_spkezr('4', times(i), 'ECLIPJ2000', 'NONE', 'SUN');
    mars_positions = [mars_positions mars_pos(1:3)];

end

figure('color','white');
hold on
plot3(ans(:,1),ans(:,2),ans(:,3))
plot3(earth_positions(1,:),earth_positions(2,:),earth_positions(3,:))
plot3(mars_positions(1,:),mars_positions(2,:),mars_positions(3,:))
xlabel('x [km]');
ylabel('y [km]');
zlabel('z [km]');
axis equal
title('Satellite Orbit');
grid on

function dr = odes(t, x)
mu = 1.327E11;

dr(1) = x(4); %x-vel
dr(2) = x(5); %y-vel
dr(3) = x(6); %z-vel
dr(4) = -mu*(x(1))/(norm([x(1);x(2);x(3)])^3);
dr(5) = -mu*(x(2))/(norm([x(1);x(2);x(3)])^3);
dr(6) = -mu*(x(3))/(norm([x(1);x(2);x(3)])^3);
dr = dr(:);
end

```