

**Forskarskolan i rymdteknik  
Doktorandkurs**

Introduction to Space Technology, 5 hp

Spring term 2016

Course meetings in Kiruna & Luleå

Course contents:

- Microgravity activities
- Applications of mechanics to rocket launching including a practical exercise involving building and launching model rockets.
- Introduction to plasma physics
- Magnetospheric physics: basic concepts, aurora. Auroral observation exercise.
- Ground-based space observations
- Space instrumentation
- Introduction to planetary exploration

**COURSE SCHEDULE**

**v 8 2016 Kiruna, room D1 Rymdcampus, unless otherwise stated**

	<b>23 Feb. T</b>	<b>24 Feb. W</b>	<b>25 Feb. T</b>	<b>26 Feb. F</b>
	08:30 – 09:30 Course information (CN)	08:30 – 11:00 Introduction to plasma physics (CN)	08:30 – 10:30 Space plasma and instrumentation (CN)	8:30 – 11:30 Rocket launching (CN)
	10:00 – 12:00 Microgravity activities (CN)	11:00 – 12:00 Magnetospheric physics (CN)	10:30 EISCAT visit	
	13:00 – 16:30 Rocket equations + rocket building (CN)	13:00 – 14:30 Aurora & aurora exercise (CN)	12:30 – 14:30 Planetary exploration (CN)	
		15:00 – 16:30 Rocket exercise continued (CN)	15:00 – 16:30 Stability test of model rockets, and launch preparations (CN)	
		Evening auroral observations (CN)	Evening auroral observations	

**v 15 2016 Luleå** (location to be arranged)

<b>11 Apr. M</b>	<b>12 Apr. T</b>	<b>13 Apr. W</b>	<b>14 Apr. T</b>	<b>15 Apr. F</b>
13:00 – 14:00 Review of status of course assignments (CN)	9:00 – 10:00 Overview of on-line packages for space applications (CN)	9:00 – 11:00 EISCAT_3D (APW)		
14:30 – 16:30 Challenges of human exploration of the solar system (CN)	10:30 – 12:00 Problem class (CN)	12:00 – 13:00 Solar system dust (APW)		
	13:30 – 15:30 Radar technology (APW)	13:30 – 15:30 Student project presentations (CN & APW)		

**Participating teaching staff**

Dr Carol Norberg (CN), Reader in Space Physics & Professor Asta-Pellinen Wannberg (APW), Umeå University, Department of Physics and Swedish Institute of Space Physics

**Course material**

Students should bring a laptop with them to each session.

Literature:

It's Only Rocket Science, Lucy Rogers, Springer (2008)

Recommended reading:

Human Spaceflight and Exploration, editor Carol Norberg, Springer/Praxis, (2013)

Introduction to Space Physics, M.G. Kivelson and C.T. Russell, Cambridge University Press, (1995)