



Human Spaceflight and Exploration, 7.5 ECTS

5– 23 August 2013

This course is financed by the Swedish Government and is run at the Swedish Institute of Space Physics in Kiruna.

<p>5 Aug. IRF Regular bus departs bus station 09:10 9:45 – 10:30 General information and course registration. 10:45 – 11:15 <i>Presentation of the Swedish Institute of Space Physics</i> (Aulan, Rick McGregor). 11:20 – 12:00 Tour of the Space Campus 13:30 - 16:30 Introduction to the <i>European Space Agency and space exploration</i> (Aniara, Olle Norberg) Regular bus departs 16:35 18:00 – 19:00 Ice breaker: Bowling</p>	<p>6 Aug. Parkskolan 9:00 – 10:00 <i>Presentation of the Kiruna Study Centre</i> Entrance B (Auditorium, Maria Délice Fredriksson 10:15 – 12:00 <i>Basics of gravitation & Rocket laboratory & Introduction to group project</i> (Auditorium, Carol Norberg) 13:00 – 17:00 Students work on space history, (Group rooms, Parkskolan)</p>	<p>7 Aug. Parkskolan 9:30 – 11:30 <i>Human spaceflight operations & experiences of spaceflight.</i> Video conference with Reinhold Ewald, ESA 13:00 – 17:00 Student presentations on space history continue. (Auditorium, Carol Norberg)</p>	<p>8 Aug. IRF 9:45 – 10:30 & 10:45 – 11:30 <i>The space environment</i> (Aniara Carol Norberg) 13:00 – 13:45 <i>The space environment: radiation</i> (Aniara Carol Norberg) 14:15 – 16:30 Rocket building lab</p>	<p>9 Aug. Parkskolan 9:30 – 11:00 <i>Mars 500 and human research on ISS.</i> Video conference with Jennifer Ngo-Anh, ESA 11:30 – 13:30 Computer-based radiation laboratory (Computer Room B28, Parkskolan, Carol Norberg) Afternoon: project work & rocket calculations</p>
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<p>12 Aug. Town Visit to the LKAB underground mine Depart 8:45 from the bus station. Carina Gunillasson</p> <p>Afternoon in Parkskolan, rocket calculations 13:30 – 14:30 (Carol Norberg)</p> <p>Afternoon: project work & rocket calculations</p>	<p>13 Aug. IRF 9:45 – 10:30 & 10:45 – 11:30 <i>Lectures by ESA astronaut Christer Fuglesang on space radiation, scientific research on the ISS & events during his two space flights.</i> (Aula)</p> <p>13:00 – 13:45 & 14:00 – 14:45 Christer's lectures continue in the Aula.</p> <p>15:15 – 16:00 <i>Spaceport Sweden</i> (Aula, Karin Nilsson)</p>	<p>14 Aug. IRF 9:45 – 10:30 & 10:45 – 11:30 <i>Overview of microgravity research,</i> (Aniara, Peter Preu)</p> <p>13:00 – 13:45 <i>Drop towers</i> (Aniara, Peter Preu)</p> <p>14:00 – 14:45 <i>Parabolic flights</i></p> <p>15:15 – 16:00 <i>Sounding rockets & Foton/Bion</i> (Aniara, Peter Preu)</p>	<p>15 Aug. IRF 9:45 – 10:30 <i>ISS</i> (Aniara, Peter Preu)</p> <p>10:45 – 11:30 <i>ISS & Shenzou</i> (Aniara, Peter Preu)</p> <p>12:30 Estrate Chartered coach transport to Swedish Space Corporation Estrate. Return to town approximately 17:00.</p>	<p>16 Aug. Parkskolan 09:30 – 12:00 <i>Astronaut selection & Crew selection workshop</i> (Auditorium & group rooms, Carol Norberg)</p> <p>Afternoon: project work</p>
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<p>19 Aug. IRF 9:45 – 11:30 <i>Space exploration at the Swedish Institute of Space Physics</i> (Hans Nilsson, Aniara)</p> <p>13:00 – 13:45 & 14:00 – 14:45 & 15:15 – 16:00 <i>Life support systems</i> (Aniara, Ingemar Skoog)</p>	<p>20 Aug. IRF 9:45– 10:30 10:45 – 11:30 <i>Space suits</i> (Aniara, Ingemar Skoog)</p> <p>12:30 – 13:15 <i>Space suits continued</i> (Aniara, Ingemar Skoog)</p> <p>13:30 – 16:30 <i>Life support systems workshop</i> (Aniara, Carol Norberg & Ingemar Skoog)</p>	<p>21 Aug. IRF 9:45 – 10:30 10:45 – 11:30 <i>Space suits continued</i> (Aniara, Ingemar Skoog)</p> <p>11:45 – 12:30 <i>Meteors</i> (Aniara, Asta Pellinen-Wannberg)</p> <p>12:30 – 16:30 Rocket launching.</p>	<p>22 Aug. Parkskolan 9:00 – 11:30 <i>Student project presentations</i> (Auditorium)</p>	<p>23 Aug. Parkskolan 9:00 -12:00 EXAM (Auditorium, Parkskolan)</p>
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Bus number 501 leaves from the bus station in the centre of town at 09:10, arriving at the Swedish Institute of Space Physics at 9:30. The bus returns at 16:35.

BUSSTURLISTA

2013-06-17 -- 2013-08-18

Kiruna - Svappavaara				Går upp till IRF			Går upp till IRF			Sönd/helgdag	
Linje	52	53	10	501	50	10	501	53	53	50	
Kiruna busstation	06.00	07.10	07.30	09.10	14.00	14.50	15.25	17.00	13.30	18.55	
Hospital	06.02	07.11	-	09.13	14.03	-	15.28	17.01	13.31	18.58	
Coop	06.05	07.13	-	-	14.05	-	-	17.03	13.33	19.00	
IRF ca tid E10	06.10	07.23	07.40	09.30	14.15	15.00	15.50	17.13	13.43	19.05	
Jukkasjärvi	-	-	-	09.40	-	-	16.05	-	-	-	
Svappavaara	06.40	07.50	08.05	-	14.45	15.25	-	17.40	14.10	19.30	
Svappavaara - Kiruna				Går upp till IRF			Går upp till IRF			Sönd/helgdag	
Svappavaara	17.20	15.50	13.00	-	08.50	19.35	-	22.40	19.00	16.55	
Jukkasjärvi	-	-	-	09.40	-	-	16.25	-	-	-	
IRF ca tid E10*	17.45	16.15	13.25	09.50	09.25	20.00	16.35	23.00	19.20	17.20	
Coop	18.00	16.25	-	-	09.35	-	-	23.10	19.30	17.35	
Hospital	18.05	16.30	-	10.05	09.40	-	16.50	23.15	19.35	17.40	
Kiruna busstation	18.10	16.35	13.35	10.10	09.45	20.10	16.55	23.20	19.40	17.45	

*OBS: Alla bussar förutom Linje 501 stannar på hållplatsen på E10.

Participating staff

Dr Carol Norberg, Reader in Space Physics, Lecturer in Physics Umeå University & Swedish Institute of Space Physics, Kiruna, Sweden

Carina Gunillasson, Course administrator, Swedish Institute of Space Physics

Dr. Rick McGregor Research & Development Officer, Swedish Institute of Space Physics, Kiruna, Sweden

Dr. Olle Norberg, Director General Swedish National Space Board

Maria-Delice Fredriksson, Assistant Education Manager, Kiruna Study Centre, Sweden

Dr. Reinhold Ewald, Former European Space Agency Astronaut (Mir 97) now in the International Space Station Operations Department.

Dr. Jennifer Ngo-Anh, European Space Agency

Karin Nilsson, Executive MBA, CEO Spaceport Sweden

Dr. Hans Nilsson, Physicist, Swedish Institute of Space Physics, Kiruna, Sweden

Dr. Peter Preu, Head of Microgravity Research and Life Sciences, German Aerospace Center, DLR

Dr. Christer Fuglesang, European Space Agency Astronaut (STS-116 & STS-128), Royal School of Technology Stockholm & Swedish National Space Board, Honorary doctor at Umeå University

Dr. Å Ingemar Skoog, Programme manager for European spacesuit development, Astrium GmbH, 1986-1994. Co-author of *Russian Spacesuits*, 2003, Springer-Praxis
Professor Asta Pellinen-Wannberg, Umeå University & Swedish Institute of Space Physics

Mats Tyni & Mattias Abrahamsson, Swedish Space Corporation, Esrange Space Center

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