

## Short course on “Fundamentals on Antennas”

20<sup>th</sup> – 24<sup>th</sup> October, 2025

Universidad Carlos III de Madrid, Campus Puerta de Toledo (EPS), Leganés-Madrid

| Timing             | Monday<br>20 <sup>th</sup> october                                                                                                          | Tuesday<br>21 <sup>st</sup> october                                                                                                 | Wednesday<br>22 <sup>nd</sup> october                                                                                | Thursday<br>23 <sup>rd</sup> october                                                                                                                | Friday<br>24 <sup>th</sup> october                                                                                                                                                                                                                                                                                                            |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8:45-9:45<br>EPS   | History of antennas.<br>Fundamentals I:<br>overview.<br><b>Prof. Daniel Segovia-<br/>Vargas</b><br><b>Uni. Carlos III Madrid<br/>(UC3M)</b> | Elementary antennas I:<br>wire antenna<br>(monopoles and<br>dipoles)<br><b>Prof. Zbynek Raida</b><br>Brno University                | Fundamentals on<br>antenna arrays<br><b>Prof. Daniel Segovia<br/>Vargas</b><br><b>(UC3M)</b>                         | Aperture- antennas I:<br>horn antennas.<br><b>Prof. Ana Arboleya</b><br><b>Universidad Rey Juan<br/>Carlos (URJC)</b>                               | <b>Hot topic 1:</b><br>High frequency<br>antennas (35-40')<br><b>D. González-Ovejero</b><br><b>INRS-Rennes</b><br><b>Hot topic 2:</b><br>Introduction to active<br>antennas (35-40').<br><b>Prof. Daniel Segovia</b><br><b>Hot topic 3:</b><br>Reflectarrays,<br>metasurfaces, RIS<br>(35-40')<br><b>Eduardo Martínez de<br/>Rioja (URJC)</b> |
| 9:45-10:45<br>EPS  | Fundamentals I:<br>classification and<br>parameters.<br><b>Prof. Kerlos Atia</b><br><b>Uni. Carlos III Madrid</b>                           | Elementary antennas I,<br>wire antennas<br>(monopoles and<br>dipoles)<br><b>Prof. Zbynek Raida</b>                                  | Fundamentals on<br>antenna arrays<br><b>Prof. Daniel Segovia<br/>Vargas</b><br><b>(UC3M)</b>                         | Aperture- antennas I:<br>reflector antennas.<br><b>Prof. Ana Arboleya</b><br><b>(URJC)</b>                                                          |                                                                                                                                                                                                                                                                                                                                               |
| 10:45-11:05        | <b>Coffee Break (20 minutes)</b>                                                                                                            |                                                                                                                                     |                                                                                                                      |                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                               |
| 11:05-12:05<br>EPS | Fundamentals II:<br>antenna parameters,<br>propagation equation.<br><b>Prof. Kerlos Atia</b><br><b>(UC3M)</b>                               | Modelling tools:<br>integral equation (IE)<br>and method of<br>moments (MoM)<br><b>Prof. Juan R. Mosig</b><br><b>EPFL</b>           | Fundamentals on<br>antenna arrays and<br>applications<br><b>Prof. Daniel Segovia<br/>Vargas</b><br><b>(UC3M)</b>     | Broadband antennas<br><b>Prof. Daniel Segovia<br/>Vargas</b><br><b>(UC3M)</b>                                                                       | <b>Hot topic 4:</b><br>3D-printed antennas<br>and additive<br>manufacturing<br>(35-40')<br><b>Prof. Kerlos Atia</b><br><b>Hot topic 5:</b><br>AI in EM and<br>antennas<br>(35-40').<br><b>Prof. Adrián Amor</b><br><b>(UC3M)</b><br>Wrap-up And Test                                                                                          |
| 12:05-13:15<br>EPS | Introduction to<br>Electrodynamics and<br>radiation fundamentals.<br><b>Prof. Daniel Segovia<br/>Vargas (UC3M)</b>                          | Microstrip antennas.<br><b>Prof. Juan R. Mosig</b><br><b>EPFL</b>                                                                   | Application:<br>Integrated antenna<br>systems, GPS, GSM.<br><b>Prof. Zbynek Raida</b><br>Brno University             | Fundamentals on<br>Measurements<br><b>Prof. Ana Arboleya</b><br><b>(URJC)</b>                                                                       |                                                                                                                                                                                                                                                                                                                                               |
| 13:15-14:15        | <b>Lunch: PT canteen</b>                                                                                                                    | <b>Lunch: PT canteen</b>                                                                                                            | <b>Lunch: PT canteen</b>                                                                                             | <b>Lunch: PT canteen</b>                                                                                                                            | <b>Lunch: cocktail</b>                                                                                                                                                                                                                                                                                                                        |
| 14:30-15:45        | Introduction to em<br>modeling tools.<br><b>Prof. L.E. García Castillo</b><br><b>Uni. Carlos III Madrid</b>                                 | Fundamentals of<br>Antennas simulation<br>using HFSS<br><b>Prof. Kerlos Atia</b><br><b>and Dr. Celia Gómez-<br/>Molina (Ansys)</b>  | Advanced Antennas<br>simulation using HFSS<br><b>Prof. Kerlos Atia</b><br><b>and Celia Gómez-<br/>Molina (Ansys)</b> | Onsite: <b>Move to<br/>Leganés campus at<br/>14:30</b><br>Measurements in<br>anechoic chamber<br><b>Online: it will be<br/>arranged by a camera</b> |                                                                                                                                                                                                                                                                                                                                               |
| 15:45-16:30        | Fundamentals II and<br>introduction to Lab and<br>software<br><b>Prof. Kerlos Atia</b><br><b>Abdalmalak (UC3M)</b>                          | Fundamentals of<br>Antennas simulation<br>using HFSS<br><b>Prof. Kerlos Atia and</b><br><b>Celia Gómez-Molina</b><br><b>(Ansys)</b> | Advanced Antennas<br>simulation using HFSS<br><b>Prof. Kerlos Atia</b><br><b>and Celia Gómez</b><br><b>(Ansys)</b>   | Lab: session 4 antenna<br>measurement.<br><b>BTS measurements at</b><br><b>SATIMO TECH. PARK</b>                                                    |                                                                                                                                                                                                                                                                                                                                               |
| 17:00-19:00        |                                                                                                                                             | <b>Visit to Prado<br/>Museum (tbc)</b><br><b>It starts at 17:00</b>                                                                 |                                                                                                                      | Onsite: The return<br>will be around 18:00                                                                                                          |                                                                                                                                                                                                                                                                                                                                               |
| 20:00-20:30        |                                                                                                                                             | <b>20:00: Social<br/>meeting: “De tapas in<br/>Madrid” (tbc)</b>                                                                    |                                                                                                                      | <b>20:30: Social dinner<br/>at Café de Oriente</b>                                                                                                  |                                                                                                                                                                                                                                                                                                                                               |