

# 2024 EFTS Week Schedule

| Time          | Mon, July 1   | Tue, July 2   | Wed, July 3   | Thu, July 4  | Fri, July 5   | Colors   |
|---------------|---|---|---|--|---|--|
| 8:15          | <b>7:30–8:30 Registration</b>   | <b>Coffee</b>   | <b>Coffee</b>   | <b>Coffee</b>  | <b>Coffee</b>   | Logistics & events<br>Lectures   |
| 8:30 – 9:20   | <b>8:30</b> Introduction to TF<br>Y. Le Coq<br>SYRTE & FIRST-TF                     | Relativity<br>Frédéric Meynadier<br>BIPM, Int'l           | Navigation & GNSS<br>Carsten Rieck, RISE, SE                      | Synchronization over<br>Digital Networks<br>K. Teichel, PTB, DE                    | 8:30–11:30<br>Laboratory  | Labs / computer<br>Welcome & Closing   |
| 9:20 – 10:10  | Introduction to Oscillators<br>E. Rubiola, FEMTO, FR                                | Intro Atomic Clocks<br>G. Mileti, LTF, CH                 | FS Combs<br>J. Kronjäger, PTB, DE                                 | Cold Atoms<br>C. Lacroûte, FEMTO, FR   |   | 3. SDR, GPS & PRN<br>(9:30-11:30)<br>4. GPS RX & RINEX<br>5. Atomic clock<br>6. Resonators |
| 10:10 – 10:40 | <b>Coffee &amp; cookies</b>   | <b>Coffee &amp; cookies</b>                               | <b>Coffee &amp; cookies</b>                                       | <b>Coffee &amp; cookies</b>  | Chapter 1<br>General &<br>Applications<br>Enrico Rubiola                          |  |
| 10:40 – 11:30 | Phase Noise<br>Craig W. Nelson<br>NIST, USA   | Stabilized Lasers<br>C. Lacroûte, FEMTO                   | Satellite Synch<br>Carsten Rieck, RISE, SE                        | Optical Clocks<br>Rachel Godun, NPL, UK  | Chapter 2<br>Meas & Oscillators<br>Enrico Rubiola                                 |  |
| 11:30 – 12:20 | Variances<br>F. Vernotte, FEMTO, FR   | Free-space links<br>Sascha Schediwy<br>Univ. W. Australia | Small Clocks<br>G. Mileti, LTF, CH                                | Attosecond pulses<br>Romain Geneaux<br>CEA, FR                                     | Chapter 3<br>Atomic Clocks<br>Gaetano Mileti                                      |  |
| 12:20 – 13:50 | <b>Lunch</b>  | <b>Lunch</b>  | <b>Lunch</b>  | <b>Lunch</b>   | 11:30 Quick coffee<br>11:45-12:30<br>Historical Perspective<br>F. Vernotte, FEMTO | Chapter 4<br>Timing & Transfer<br>Francois Vernotte  |
| 13:50 – 14:40 | Digital Controls<br>C.E.Calosso, INRiM  | Atomic Clock Physics<br>G. Mileti, LTF, CH                | Optical fiber links<br>J. Kronjäger, PTB, DE                      | Clock Synchronization<br>Security<br>K. Teichel, PTB, DE                           | 12:30—12:45 Closing<br>12:45–14:15 Lunch  | Laboratories<br>Y.Gruson, J.M.Friedt,<br>E.Rubiola   |
| 14:40 – 15:30 | Quartz Oscillators<br>Bernd Neubig<br>Axtal Consulting, DE                          | Atomic Time Scales<br>Frédéric Meynadier<br>BIPM, Int'l   | <b>Coffee</b>   | <b>Coffee</b>  | 14:15–16:15<br>Visit, Observatory<br>or FEMTO-ST                                  | All lectures in Jules<br>Haag auditorium   |
| 15:30 – 16:00 | <b>Coffee</b>   | <b>Coffee</b>   | 15:10–17:10<br>Laboratory<br>1, 3 & 4<br>(Noise, SDR, RINEX)      | 15:00–18:00<br>Laboratory<br>3. SDR, GPS & PRN<br>5. Atomic clock<br>6. Resonators |   |  |
| 16:00 – 18:00 | Laboratory<br>1. PM/AM noise,<br>2. Data Analysis                                   | Laboratory<br>1. PM/AM noise,<br>2. Data Analysis         |   |  | You are free  |  |
| 18:00 – 19    | <b>Science, beer and chips</b><br>at the TF Department<br>(ethanol-free drinks too) | (free time)   | <b>Visit at the</b><br><b>Museum of Time,</b><br><b>and Drink</b> | <b>Go to the pier</b>  |   | Last update<br>June 14, 2024,<br>at 11:20  |
| 19 – 20       |   |   |   |  |   |  |
| 20 – 21:30    | <b>Dinner on your own</b>   | <b>Dinner on your own</b>                                 | <b>Dinner on your own</b>   | <b>Social Dinner</b>   |   |  |
| 21:20 – 24    | Backup for the Astronomy session,<br>depending on weather                           | <b>Astronomy</b><br>depending on weather                  | Last chance for the Astronomy<br>session, depending on weather    | <b>Boat on the river 19:30</b><br>(boat leaves at 19:45)                           |   |  |

| 2024 EFTS Laboratories |   |       |  |       |  |             |  |   |       |  | Updated June 28<br>at 12:15  |             |
|------------------------|---|-------|--|-------|--|-------------|--|---|-------|--|--|-------------|
| Group                  | Mon 1<br>16:00–18:00  |       | Tue 2<br>16:00–18:00   |       | Wed 3<br>15:10 – 17:10   |             | Thu 4<br>15:00 – 18:00   |   |       | Fri 5<br>8:30 – 11:30  |  |             |
|                        | 16–17   | 17–18 | 16–17  | 17–18 | 15:10–16:10  | 16:10–17:10 | 15–16  | 16–17   | 17–18 | 8:30–9:30  | 9:30-10:30   | 10:30–11:30 |
| Ar                     | Lab.1: PM/AM noise<br>M. Abdel Hafiz<br>C. Fluhr, J. Millo,<br>E.Rubiola<br><br>Tesla H-I (–102/–103) |       | Lab.2: Data Analysis<br>F. Vernotte<br><br>Computers 1.32.32                                       |       | Lab.3: SDR, GPS & PRN<br>JM. Friedt<br><br>Computers 1.32.32   |             | Lab.5. Atomic Clock<br>C. Lacroûte,<br>M. Abdel Hafiz<br><br>2.22.34<br><br>12 people in 4 groups of 3 |   |       | 6:Resonat.<br>V. Giordano<br>2.26.34   | Lab 4. GPS RX, RINEX<br>F. Meyer, E. Meyer<br>N. Gautherot<br>Tesla J (–101) |             |
| Be                     |   |       |  |       |  |             |  |   |       | 6:Resonat.<br>D. Teyssieux<br>2.28.34  |  |             |
| Cs                     | Lab.2: Data Analysis<br>F. Vernotte<br><br>Computers 1.32.32  |       | Lab.1: PM/AM noise<br>M. Abdel Hafiz<br>R. Boudot, J. Millo,<br>E.Rubiola<br>Tesla H-I (–102/–103) |       | Lab.4 : GPS RX, RINEX<br>F. Meyer, E. Meyer<br>N. Gautherot<br>Tesla J (–101)                          |             | 6:Resonat.<br>V.Giordano<br>2.26.34  | Lab 3: SDR,<br>GPS & PRN<br>JM. Friedt<br><br>Computers 1.32.32 |       | Lab.5. Atomic Clock<br>C. Lacroûte,<br>M. Abdel Hafiz<br>2.22.34<br>12 people in 4 groups of 3 |  |             |
| Dy                     |   |       |  |       |  |             | 6:Resonat.<br>D.Teyssieux<br>2.28.34   |   |       |  |  |             |
| Er                     | Lab.2: Data Analysis<br>F. Vernotte<br>Computers 1.32.32  |       | free   |       | Lab.1: PM/AM noise<br>M. Abdel Hafiz<br>R. Boudot, C. W. Nelson,<br>E.Rubiola<br>Tesla H-I (–102/–103) |             | free   |   |       | free   | Lab.3: SDR, GPS & PRN<br>JM. Friedt<br><br>Computers 1.32.32                 |             |
| F                      | free  |       | Lab.2: Data Analysis<br>F. Vernotte<br>Computers 1.32.32   |       |  |             | free   |   |       | free   |  |             |
| Ga                     | free  |       |  |       |  |             |  |   |       |  |  |             |

|   | Regular groups |           |        |            | Additional groups (fewer labs) |          | Guests  |
|---|----------------|-----------|--------|------------|--------------------------------|----------|---------|
|   | Argon          | Beryllium | Cesium | Dysprosium | Erbium                         | Fluorine | Gallium |
| 1 |                |           |        |            |                                |          |         |
| 2 |                |           |        |            |                                |          |         |
| 3 |                |           |        |            |                                |          |         |
| 4 |                |           |        |            |                                |          |         |
| 5 |                |           |        |            |                                |          |         |
| 6 |                |           |        |            |                                |          |         |