Valuable STEM instruction that will result in student learning!

Help students make the connections between the engineering and technology applications of science and math concepts.

At the Teachers Institute, teachers have opportunities to explore and experience firsthand:

- Wireless technology fundamentals and the foundation of radio science
- Techniques to instruct the basic electronics of radio
- Concepts integral to microcontrollers, robotics, and programming
- Satellite communication and telemetry data
- Sensor technology
- Data gathering and analysis

For an application and more information about the Teachers Institute, please visit [www.arrl.org/ti](http://www.arrl.org/ti)

**TI-1 Introduction to Wireless Technology**

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<tr>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>July 13-17, 2020</td>
<td>Dayton Amateur Radio Association</td>
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<tr>
<td></td>
<td>Dayton, OH</td>
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<tr>
<td>July 20-24, 2020</td>
<td>ARRL Headquarters,</td>
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<td>Newington, CT</td>
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**TI-2 Remote Sensing and Data Gathering**

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<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>July 6-10, 2020</td>
<td>ARRL Headquarters,</td>
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<tr>
<td></td>
<td>Newington, CT</td>
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**Application Deadline for all sessions is May 1, 2020**
Cost
Tuition, resources, and most expenses to attend are paid by donations to the ARRL Education and Technology Program (ETP) Fund. Travel (up to $600) and lodging expenses are reimbursed and a per diem for meals is provided.
To qualify for full expense reimbursement, participants must complete all Institute activities.
A $100 enrollment fee is required with the application. (Enrollment fees are refunded to applicants who are not admitted.)

Applicant Eligibility
- Teachers active in school, college, or professional educational organizations serving grade levels 4-12+, or those leading school affiliated enrichment programs.
- An Amateur Radio license is NOT required to attend the introductory TI-1 session but is required for the TI-2 program.
- Completion of the TI-1 program and a current ARRL membership are required to participate in the TI-2 program.

The Teachers Institute is supported through generous contributions to the ARRL Education & Technology Fund by individuals and Amateur Radio clubs, with additional in-kind support from equipment vendors. Donations fund tuition, resources, and expenses of the Teachers Institute, as well as equipment grants to schools for Amateur Radio stations. Support the program with a donation at www.arrl.org/etp.

TI-1 Wireless Technology
The Teachers Institute (TI-1) is a 5-day professional development workshop filled with discussions and idea sharing, hands-on activities and demonstrations, building, programming, robotics, and exploration in Amateur Radio. Teachers are offered tools and strategies to introduce basic electronics, radio science, satellite communication, Amateur Radio, microcontrollers and basic robotics to their students. Participants are provided with materials such as an ARRL resource library, basic electronics, test equipment, and robotics kits.

Two sessions of the TI-1 workshop are offered to qualified applicants. Enrollment for each TI-1 session is limited to 12-14 participants to maximize participation and individual attention.

Refer to our website www.arrl.org/ti for an agenda and to download an application.

TI-2 Remote Sensing and Data Gathering & Analysis
This advanced Institute focuses on the basic electronics of sensors (temperature, pressure, position, humidity, etc.), the analog to digital conversion of sensor data, the microcontroller programming involved in accessing sensors, and the use of radio to connect sensor outputs to the user. Once the basics of remote sensing are introduced, teachers assemble a buoy system for deploying sensors to do environmental studies.

The TI-2 also includes a demonstration of telemetry data gathering from amateur satellites, basic amateur satellite operation, and a discussion of applications of the satellite data to math and science topics. TI-2 participants will learn how to configure the Boe-Boat® robot provided in the introductory workshop for MAREA—Mars Lander Amateur Radio Robotic Exploration Activity—operation.

It’s a very full 5 days!
Enrollment for the TI-2 session is limited to 10 participants to maximize participation and individual attention.