

SPECTRUM MINING

at millimeter waves

Digging for Capacity

As more spectrum users squeeze into the lower frequency bands, more are also exploring the higher frequencies to meet their capacity needs. Millimeter wave frequencies, approximately 20 GHz and above, are able to meet some needs. ISART 2017 will explore millimeter waves, the technical challenges they present, and applications that use them. This year's tutorial and four panels will approach this topic from five different perspectives: regulation, industry, standards, measurement and modeling, and systems. Industry demonstrations and poster sessions from academia will round out the conference. The goal of ISART 2017 is to get us all talking, exploring new ideas, brainstorming, and perhaps even solve a couple of millimeter wave obstacles.

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Chris Anderson, U.S. Naval Academy
Rebecca Dorch, NTIA/ITS
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ISART 2017

INTERNATIONAL SYMPOSIUM ON
ADVANCED RADIO TECHNOLOGIES

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Jointly sponsored by the
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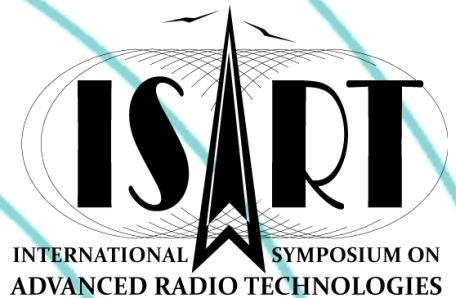


ITS

and the
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and Technology
**Communications
Technology Laboratory**



The International Symposium on Advanced Radio Technologies (ISART) is a U.S. government-sponsored conference for **technical researchers, business leaders, government policy makers, telecommunication regulators, and technology forecasters** to share groundbreaking developments and applications of advanced radio technologies and to look into the future of wireless and radio technologies.



ISART 2017

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August 15-17, 2017

Broomfield, Colorado

Register Now!



www.its.blrdoc.gov/ISART

DRAFT AGENDA

Tuesday, August 15, 2017

Morning

CSMAC Meeting 8:00-11:00

Information at <https://www.ntia.doc.gov/category/csmac> or contact David J. Reed, Designated Federal Officer, 202-482-5955, dreed@ntia.doc.gov

WSRD Meeting 11:15 a.m.-1:45 p.m.

Information at https://www.nitrd.gov/nitrdgroups/index.php?title=Wireless_Spectrum_Research_and_Development or contact Wendy Wigen, Technical Coordinator, at wigen@nitrd.gov

Afternoon

12:00 p.m.- 6:00 p.m. ISART Registration

2:00 p.m.-6:00 p.m.

Tutorial—Millimeter Waves from a Regulatory and Policy Perspective

Rebecca Dorch, NTIA/ITS; Julie Knapp, FCC/OET; NTIA/OSM; and Brian Regan, Starry, Inc.

The tutorial will the stage for the rest of the conference sessions by providing regulatory history, case studies, and background information on millimeter wave. Topics will include jurisdictional, legal, technical, and rulemaking decisions that brought us to where we are today and identification of critical remaining issues in these areas.

Wednesday, August 16, 2017

- **7:00 Registration**
- **8:00-5:00 Technology Demos and Posters**
- **8:00 Welcoming Address**
- **8:30 Keynote: Tom Power, CTIA**
- **10:00-12:00 Panel—Millimeter Wave High Speed Data Links: a Mobile Backhaul Perspective** Todd Martin, Shared Spectrum Company, Moderator

This panel will focus on high speed data link applications. Currently, millimeter wave frequencies have measurement system applications. As these components and systems increase in complexity and quantity, improvements in millimeter wave techniques will be required. As exemplified in other regulatory frameworks, millimeter waves will involve the collection, interpretation, and application of data, coupled with measurements and modeling, to demonstrate the industry's full capabilities in frequencies 20 GHz to 300 GHz.

- **1:30-2:00 Invited Talk: NTIA/OSM**
- **2:00-2:45 Invited Talk: Michael Marcus**
- **3:15-5:00 Panel—Millimeter Waves: a Standards Perspective** Jean-Aicard Fabien, NTIA/ITS, Moderator

3GPP is the global initiative for mobile broadband standards. In this panel, 3GPP participants discuss the challenges—and benefits—of standardization of mmWave technologies. They will discuss specific features like initial access, radio protocol architecture, channel coding, multicarrier issues, and connecting to legacy technologies. These features are different for each radio technology, adding to the standardization challenge.

Thursday, August 17, 2017

- **8:00-5:00 Technology Demos and Posters**
- **8:30 Welcome**
- **8:45 Invited Talk: Communications Research Centre Canada**
- **10:00-12:00 Panel— mmWave: Measurements and Modeling Perspective** Jeanne Quimby, NIST/CTL, Moderator
- **1:30-2:30 Invited Talk**
- **3:00-5:00 Panel—5G/mmWave Capacity Improvements: A Systems Perspective** Chris Anderson, Naval Academy/ITS, Moderator

Researchers will discuss the 5G mmWave spectrum cellular communication system challenges, including mmWave radio propagation in urban micro, outdoor-to-indoor building penetration, stadiums, data backhaul, self-driving cars, and other emerging scenarios while exchanging ideas, methodologies, modeling, and channel measurements.

Millimeter-waves, with their associated promise of massive bandwidths and potential for network densification, have been heralded as the solution for the exponentially growing hunger for high-speed data and greater system capacity. Despite nearly two decades of research and development, mm-wave end user devices are still prohibitively expensive. Moreover, mm-wave system design and planning have introduced new engineering challenges that are only just beginning to be addressed. This panel will explore the system-level challenges associated with deploying a mm-wave network, as well as techniques that could extend the usefulness of below 5 GHz system. It will also address significant design challenges at mm-wave frequencies.