SENS⟨⟩RS AND MEASUREMENT
THE FUTURE WITH SENSORS, RF, AND 5G

An **Elektor Webinar**

Sensors and Measurement:
The Future with Sensors, RF, and 5G

June 25, 2020

As an electronics designer, you likely work with sensor technology and measurement tools on a regular basis. In this webinar, we discuss sensors, RF solutions, and 5G technology. We address questions such as:

- How are sensors currently used? How will they be deployed in future IoT applications?
- What is 5G and why is it important?
- What are the difficulties associated with 5G?
- And more

Sensors and Measurement:
The Future with Sensors, RF, and 5G

June 25, 2020

- **Clemens Valens** is the Technical Manager of Elektor Labs. He holds a BSc in Electronics and an MSc in Electronics and Information Technology. Valens started working for Elektor in 2008 as editor in chief of Elektor France, and he has also worked as an editor for Elektor UK/US and ElektorMagazine.com. He currently produces engineering tutorials and product reviews at Elektor.tv. In recent videos, Clemens covered the following topics and more: Arduino compiler optimizations, GitHub essentials, home automation, getting started with KiCad EDA, and several informative product reviews.

- **Robert Lacoste** is the Founder and CEO of Alciom, a France-based consulting and design house specialized in mixed-signal electronics: wireless and microwaves, antennas design and optimization, high-speed signal processing, analog front-ends, sensors, and more. He graduated from Paris's Ecole Polytechnique and ENSEEIHT engineering school, and he has 30 years of experience in electronics, real-time systems, and telecommunications. Lacoste's books, *The Darker Side: Practical Applications for Electronic Design Concepts* (in English) and *Percer les mystères de l'électronique* (in French), are available in the Elektor Store.
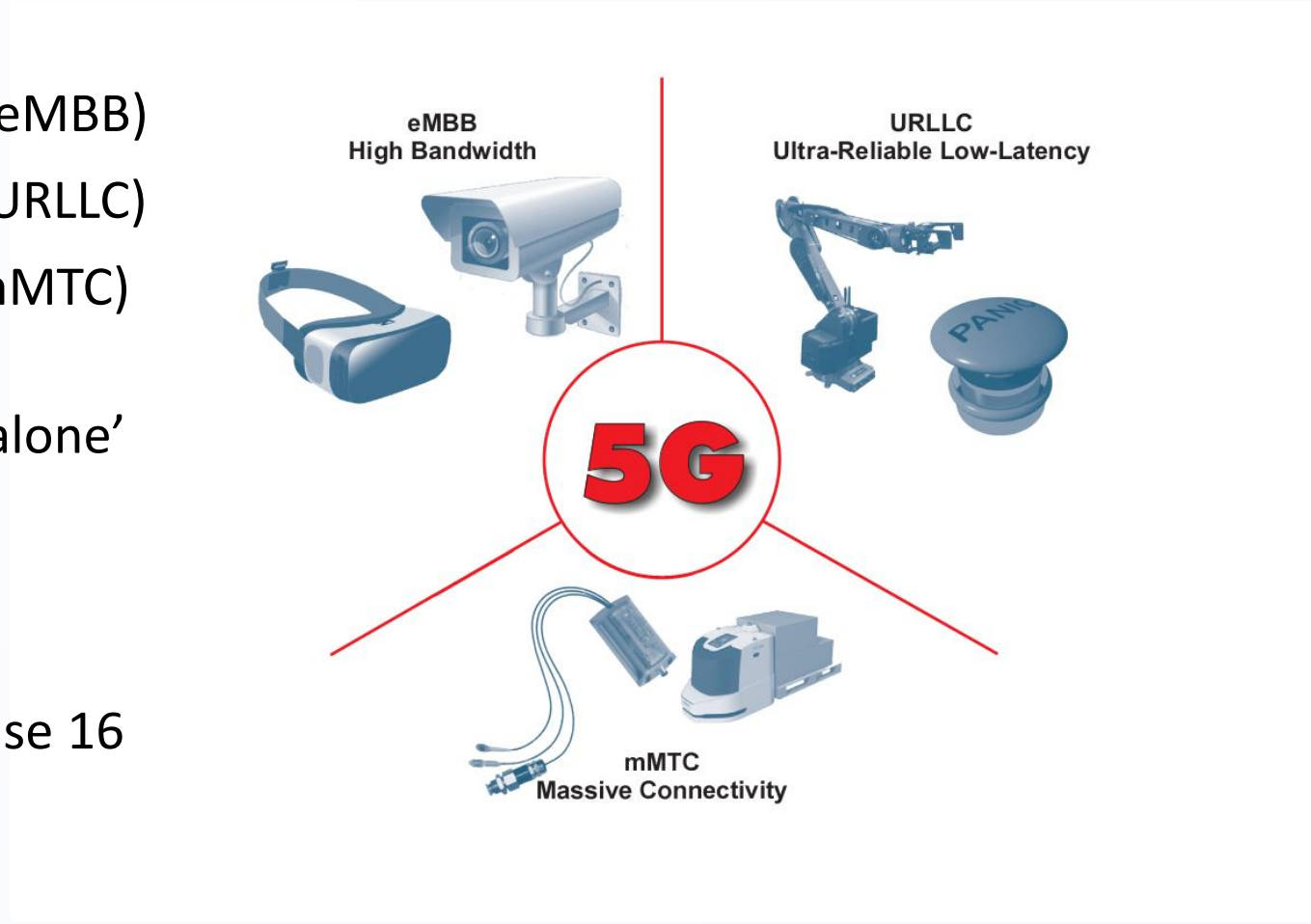
- **Stuart Cording** is an engineer and journalist with more than 25 years of experience in the electronics industry. He has held positions at National Semiconductor, Texas Instruments, Microchip Technology, Atmel, iSYSTEM, and Publitek. Cording's article, "Beyond the Razzle-Dazzle: 5G in Industrial Automation," appears in *Elektor Industry* 2/2020.

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Promise of 5G

- Increase in bandwidth (eMBB)

- Latency and reliability (URLLC)

- Massive connectivity (mMTC)

- Currently in 'non-standalone' (NSA) 5G NR phase
- 5G and LTE
- Focus: eMBB & mMTC

- Full 5G with 3GPP Release 16

- 5G NR + 5G Core
- Delivers URLLC
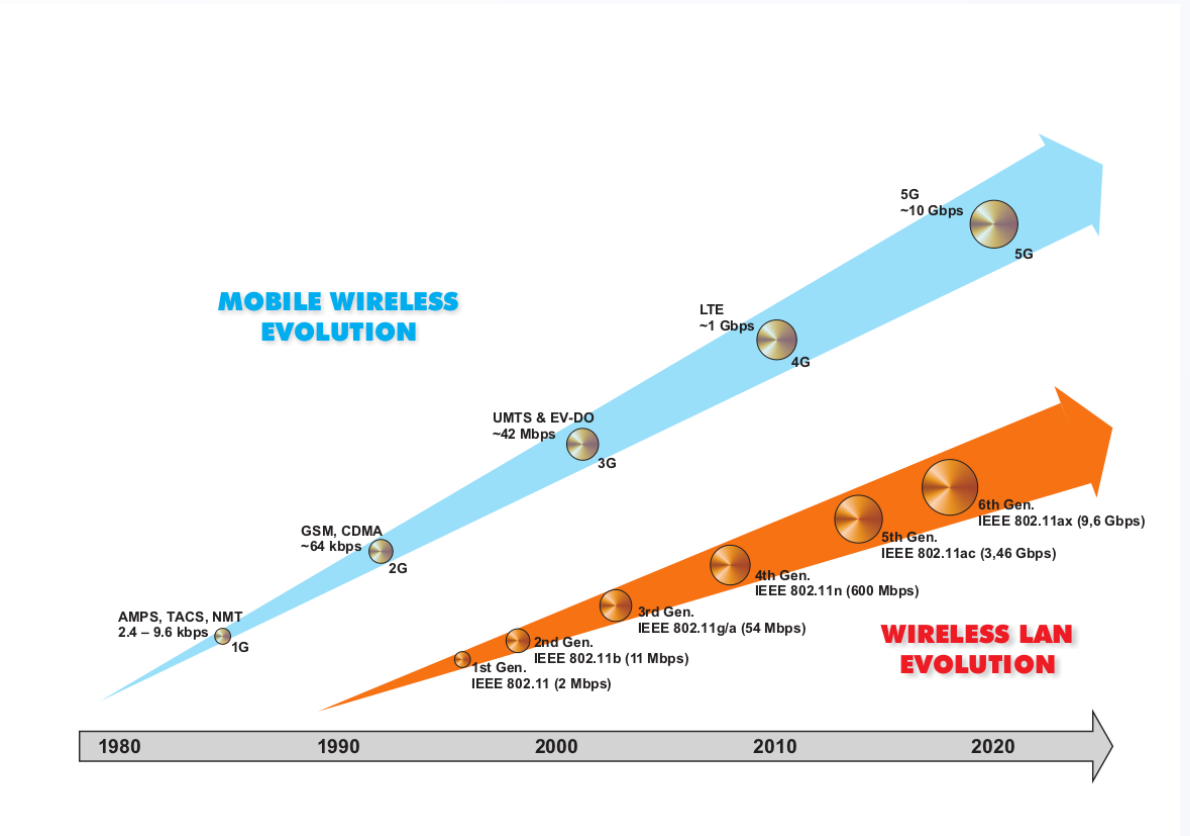
Existing 5G Trials

- 5G MoNArch
- Nokia, Deutsche Telekom, Port of Hamburg
- AR Goggles, Traffic Lights, Environment Sensing

- Cobot Application
- Audi, Ericsson
- Sub 1ms latency
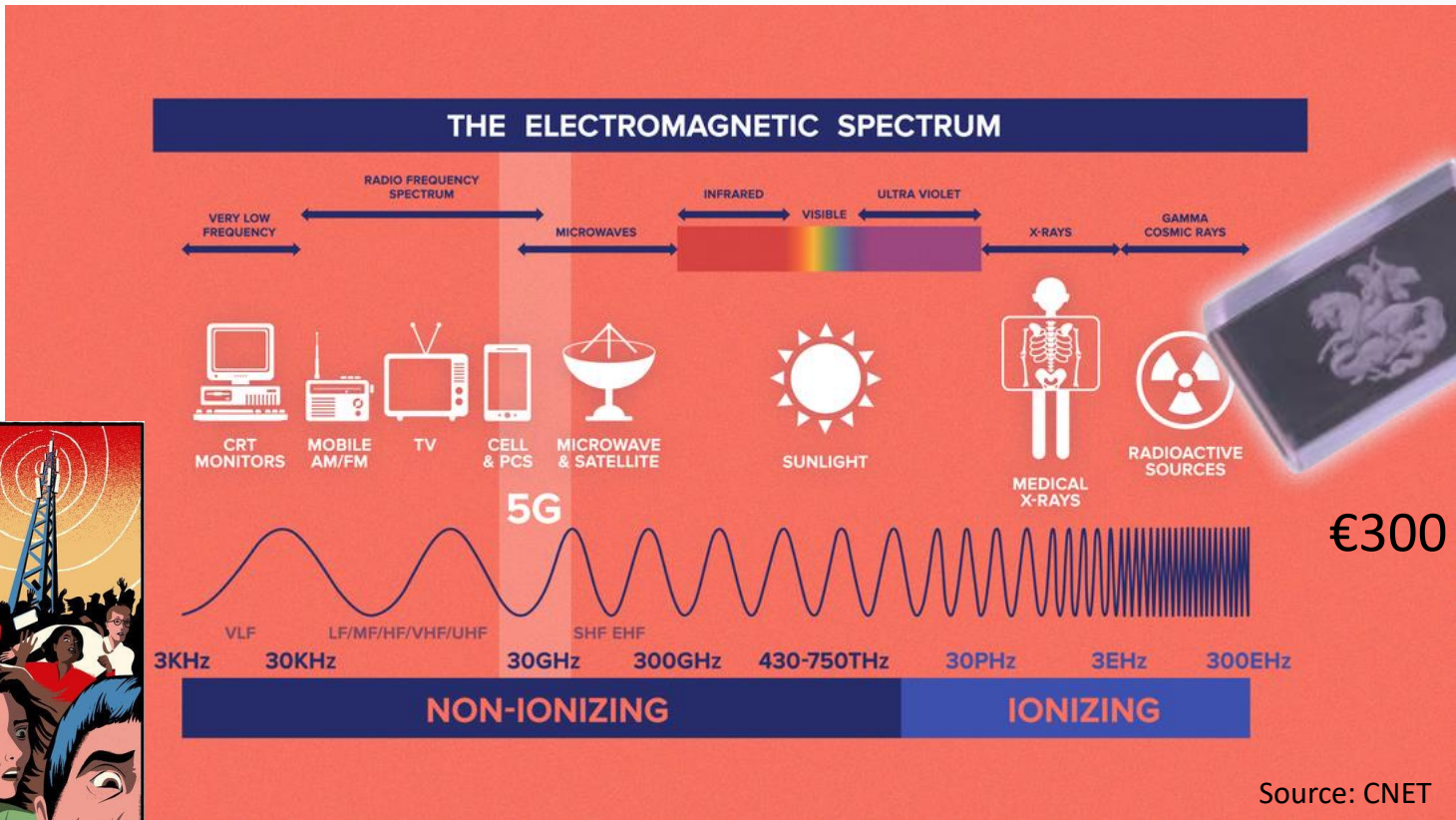- PROFIsafe over 5G
- "Not possible with 4G or Wi-Fi"

What About Wi-Fi?

- IEEE 802.11ax "Wi-Fi Gen 6"

- 9.6 Gbps

- Use in 6 GHz band FCC approved (US)

- Wireless Broadband Alliance (WBA): "Many (5G) concepts already available."

- 5G designed to be "radio agnostic"

- Could see Wi-Fi as the radio for accessing 5G Core

The Dark Side?

Source: Mobygeek

Source: CNET

€300 "Bio Shield"
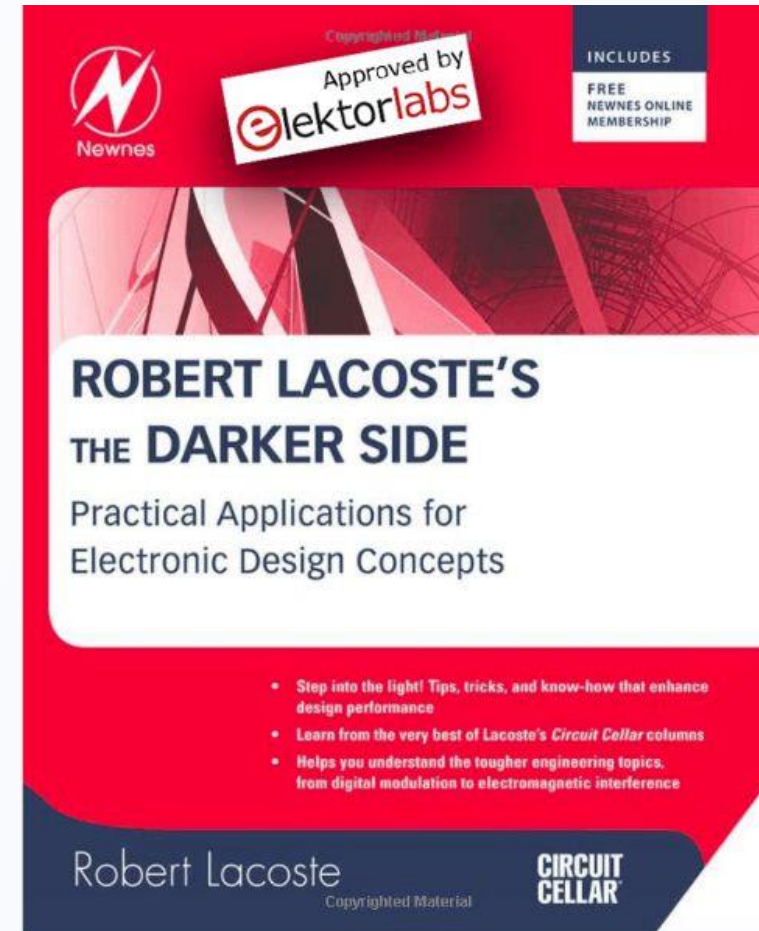
Robert Lacoste's the Darker Side

• Tips and tricks to enhance design performance

• Practical advice on topics from digital signal design to EMI

https://www.elektor.com/robert-lacoste-s-the-darker-side

Elektor Ultimate Sensor Kit

- 40 different sensors

- Book: *The Ultimate Compendium of Sensor Projects*

- Application examples for Raspberry Pi, Arduino & ESP32

https://www.elektor.com/elektor-ultimate-sensor-kit

Thank you for watching this Elektor Webinar.
Questions or comments? Email us at **labs@elektor.com**.

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Resources

- *Elektor Industry* **magazine ("Sensors & Measurement" 2020)**
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