

# Chair of Communications Engineering

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# Team

**Research & Teaching Unit:** LNT (Kramer) & LÜT (Hanik) & COD (Wachter-Zeh)

**Topics:** efficient, reliable and secure communications

**Applications:** wireless (5G), wireline (fiber-optic, DSL), biometric/device identification



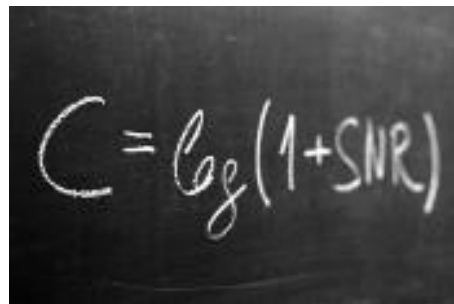
# Coding and Modulation for Industrial Applications

## Long Codes for Optical

- New universal architecture & algorithms for shaping & coded modulation
- Awarded a **2015 Bell Labs Prize** (3<sup>rd</sup> place of 250 ideas) & postdeadline at ECOC 2015
- Tremendous industry interest for optical fiber communication  
Reason: **flexibility** is key to improve **network** performance

## Short and Medium-Length Codes for 5G (Wireless and Cyber-physical Systems) and Satellite

- **Polar codes** and **LDPC codes** are part of the 5G standard
- Improved list decoding for polar codes, **short** polar codes & shaping & modulation
- **Moderate-length** LDPC codes & shaping & modulation
- **Short** codes & shaping & modulation for satellite channels


$$C = \log(1 + \text{SNR})$$