Next Generation Telecom Research Laboratory

LAB OVERVIEW

This Laboratory aims to do cutting-edge research in several sectors of telecommunications and make transformative impact of next generation telecommunication technologies for communities, industry, and Government. Innovations and advances in telecommunications will be carried out with modernized equipment and simulation tools. Next generation ultra broadband wireless network (6G and beyond) will be investigated; optical channel with multi-terabits/sec speed will be developed; PON with deep fiber deployment to support 5G and massive IoT users will be explored; ultra-high speed free-space optical communication with longer distance will be realized.

PRIMARY RESEARCH AREA

- *Wireless Communications*
- *Optical-Wireless Communications*
- *Optical Fiber Communications*
- *Radio over Fiber Communications*
- *Satellite Communications*
- *Telecommunication Networks*

FACILITIES AND EQUIPMENT

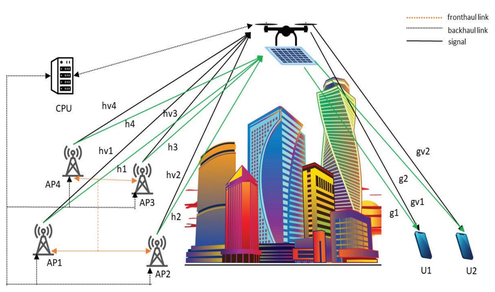
- *OTA Chamber, Vector Network Analyzer, Spectrum Analyzer, Base Station Simulator, Channel Estimator, BER Tester*
- *CST Software, RF Planning Software, Ray Tracing based Channel Generator Software*
- *OTDR, Optical Power Meter, Optical Source, Optical Detector, OSA, Fiber Inspection Microscope, Dispersion Tester, PMD Tester*
- *OCSIM, RP Photonics, OptiSystem Software*
- *Server, Workstation, Printer, Scanner*
- *Oscilloscopes, Function Generators, DC Power Supplies, Multi-meters*

MISSIONS OF THE LAB

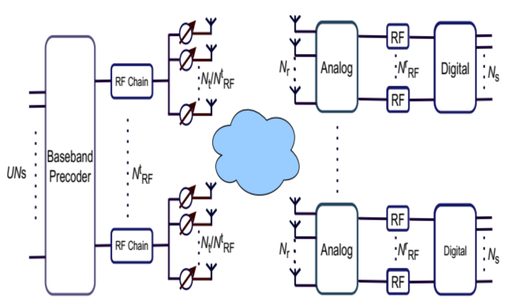
- To pioneer the next generation of wireless communication technologies, delivering unprecedented data rates, reliability, and security, while enabling innovation and shaping a future where wireless connectivity empowers transformative applications.
- To be at the forefront of innovation, shaping the future of wireless communication through the power of light.
- To develop revolutionary optical fiber communication technologies that dramatically increase data transmission rates, expand network capacity, and enhance security and reliability, all while promoting energy efficiency for the next generation of information exchange.
- To unlock the full potential of RoF technology and position it as a key driver for future communication advancements.
- To develop telecom networks combining the fixed, mobile and satellite networks to provide universal seamless high-speed, high capacity coverage.

Lab Director(s):

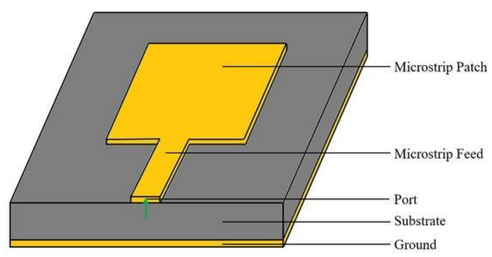
- Dr. Mohammad Faisal (mdfaisal@eee.buet.ac.bd)
- Dr. Lutfa Akter (lutfaakter@eee.buet.ac.bd)



Ongoing Research: Deep Learning based CSI Acquisition for Aerial IRS Supported Cell-Free Communication Systems

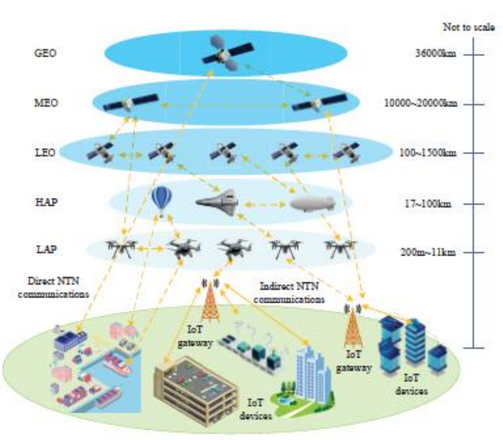


Ongoing Research: Algorithms for effective Multiuser Massive MIMO beamforming

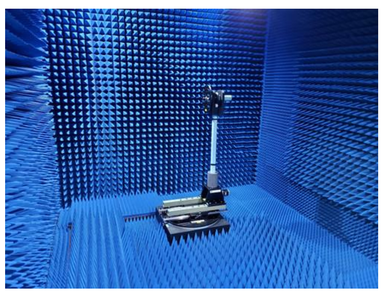


Ongoing Research:

- *Designing single-band micro-strip patch antenna for sub-6 GHz band for 5G wireless communication*
- *Designing dual-band (28/38 GHz) micro-strip patch antenna for mmWave band*
- *Performance investigation of long-haul ultra-high speed (160 Gbps and more) QAM based coherent optical fiber communication with mitigation of the impact of CD, PMD and nonlineairty*



Ongoing Research: Resource Optimization in Aerial Terrestrial Integrated Telecommunication Networks



OTA Chamber

Vector Network Analyzer

Spectrum Analyzer

Vector Signal Generator

DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

BANGLADESH UNIVERSITY OF ENGINEERING & TECHNOLOGY

4IR Advanced Research and Innovation Park