Elaboration and characterization of (nano)materials for high frequency, low power applications and advanced devices:

- III-V semiconductors: 2D heterostructures and nanostructures
- 2D materials: graphene epitaxy on SiC and metals – hBN epitaxy - Transition Metal Dichalcogenides (TMDC)
- Organic-inorganic composite nanomaterials

General objectives

- Growth of controlled structures for device purposes
- Understanding growth mechanisms
- Development of new processes or material heterostructures for advanced devices
- In-depth physical and chemical characterization of grown materials

III-V semiconductor epitaxy for advanced electronic devices

Epitaxy of 2D materials

Polymer-derived carbon materials for THz wave absorption

On-going studies and outlook...

- Graphene/hh heterostructures
  - High mobility single crystal film growth
  - Molecular Beam Epitaxy
- CVD growth on metal (E.-L. Carbon Team)
  - Growth of graphene by chemical vapor deposition on metals is a rather slow process, but requires no other (hetero)substrates
- Growth of graphene by CVD on metal (E.-L. Carbon Team)
  - Optimization of the CVD growth, towards monolayer graphene:
  - Development of the wet transfer process

Polymer-derived carbon materials for THz wave absorption

- Limited number of efficient and tunable THz absorbers
- Novel and tunable absorber based on pyrolysis of polymers (organic or hybrid organic-inorganic)

On-going studies and outlook...

- Polymer-derived carbon materials for THz wave absorption

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Epitaxy and Physics of Heterostructures