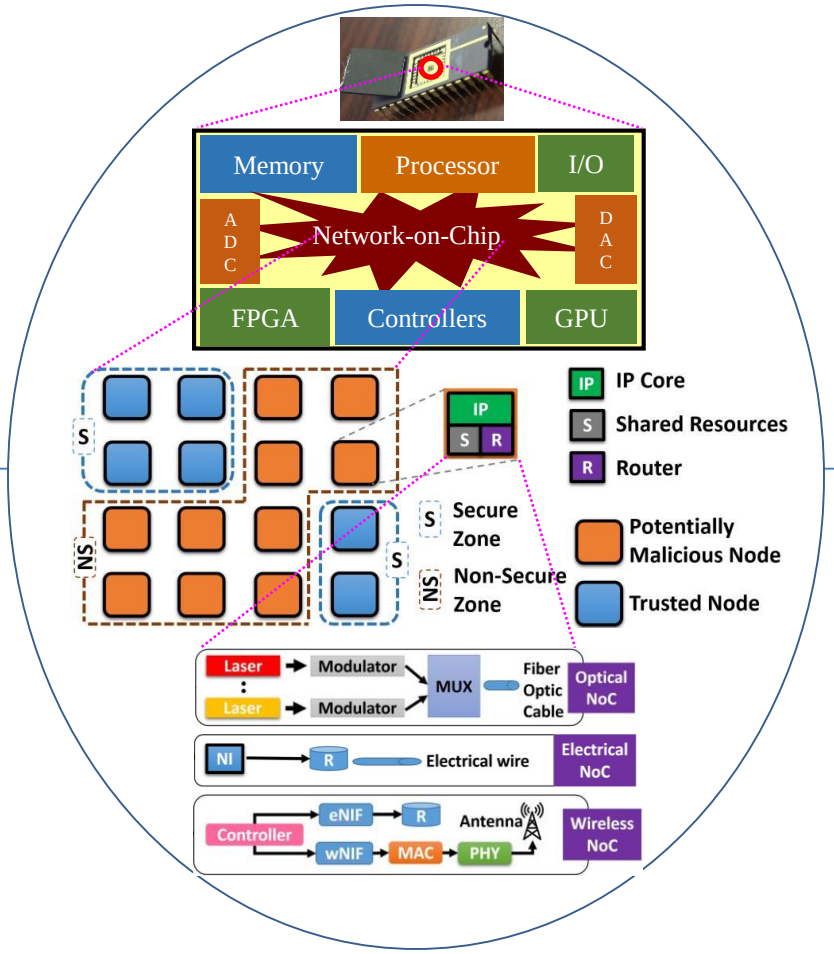
SaTC: CORE: Small: Trustworthy System-on-Chip Design using Secure On-Chip Communication Architecture

Challenge:

- Network-on-Chip (NoC) is the communication subsystem of System-on-Chip (SoC).
- NoC is a focal point for potential security attacks.
- Traditional networking security solutions are not applicable on resource-constrained NoCs.
- Securing NoC is vital to design trustworthy computing with NoC-based SoCs.

Solution:

- Develop a lightweight and secure NoC architecture for trusted communication between heterogeneous IPs in NoC-based SoCs.
- Design lightweight encryption and authentication schemes
- Provide anonymous routing
- Enable trust-aware routing
- Real-time attack detection
- Fast attack localization



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Scientific Impact:

- Applicable on electrical, optical as well as wireless NoC architectures.
- Provides lightweight solutions for securing communication in resource-constrained systems.
- Covers diverse security challenges including authentication, encryption, anonymity, attack detection and localization.

Broader Impact and Broader Participation:

- Secure NoC architecture would enable trusted SoC design with untrusted components.
- The team includes woman as well as REU researchers.
- This project has led to one book, ten book chapters, six journal articles, nine conference publications, and seven (pending) patents.