

## Proposals for Lebanon Conference

### Topic #1:

#### Title:

**Reconfigurable and Scalable Software Defined-based on Chip Orchestrator and Interconnection Network for next generation Tera-Scale Computing Systems.**

#### Topic overview

The ultra-high frequency digital transmission characteristics of intra- and inter-chip communication have been the subject of intense research over the past few years. The desire for ultra-high speed data transmission, including that of video processing, real time applications and big data management and processing, and the need for intra- and inter-chip broadband communication for such applications has been driving forces for attaining an ultra-large bandwidth and ultra-small delay time of intra- and inter-chip communication while still maintaining a low power consumption. The potential for intra- and inter-chip optical link improvements provides a compelling incentive for studying and analyzing photonic switch performance. Due to the heterogeneity of recent chips and the large number of internal cores several reconfigurable Optic Network on Chip (ONoC) have been proposed so far, they either suffer from considerable area overhead and low efficiency as a result of fully interconnected architecture, or they cannot be adapted to different topologies in the same platform.

Thus, this research tries to propose a suitable reconfigurable photonic network layer (orchestration layer using the concept of software-defined-networks (SDN)) for simultaneous transmission of different wavelengths per bidirectional waveguides and their effect on the overall power consumption under random traffic patterns is proposed. The proposed orchestrator consists of four sub-layers; namely the virtualizer, management, Photonic routing, and a control layers. These sub-layers can work separately or simultaneously. The proposed orchestrator would dynamically change the network topology according to the application request and the available resources in the optical layer at the request time.

**Topic #2:**

**Title:**

**State of the art of Small, Micro and Nano satellite technologies**