

# Agile All-Photonics Networks – A Vision of Optical Networks for 2012 and Beyond

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*Recent advances in fiber optic technology have prompted researchers to envision a future all-photonic network that is capable of supporting multiple access and services at very high bit rates. The confluence of optical transmission and optical network functions opens up new paradigms for network architectures that are enabled by emerging photonic technologies. Characteristics of these architectures and technologies that distinguish them from existing ones include: (1) networks in which the transmission of information is based on optical packets (burst-switched or packet-switched networks, with and without all-optical header recognition), (2) optical code-division multiplexing for allocating bandwidth-on-demand in bursty, asynchronous traffic environments, and (3) practical implementations for optical generation, shaping, and processing. In these all-photonic multi-access networks, any node can use a designated time slot to send a packet to any other node in the network. The bursty nature of these networks imposes new design constraints on transmitters, receivers, and optical components. We review various system and technology considerations for such networks.*