Describe application:

Two important applications:

1) Outdoor short-range (100-1000 m) link, highly connected and adaptive network to support 5G and beyond. These reasonably stationary-node networks can be used for wireless backhaul, last mile, private enterprise networking, bridging communities, etc.
2) Indoor wireless, either diffuse or directed, either IR or visible, supporting high speed, large numbers of users, and ubiquitous access.

Describe today's solutions (if any):

Today's discussion was a few individuals blowing their own horns and bullying others. Sorry – my opinion.

Define the fundamental research problems that must be addressed:

Two research problems:

1) Networking: we know how to do point-to-point very well, but wireless optical networks are a problem. We need to develop better switching, better protocols to handle the types of deep outages that can be experienced.
2) Convergence: how do we coexist, augment, enhance, replace, RF and microwave systems? This is an issue for both indoor and outdoor networks. There needs to be a technical adoption approach for each application.

Identify benefits if the problem gets solved:

The problem with the RF spectrum (the lower frequency nice part of it) is its limited bandwidth, but it also has great attributes: it is highly permeating, robust, easy to capture, etc. So the long term ideal is to rely primarily on optics (99%) for what optics can do well – lower mobility, high density areas, high throughput – and use RF only for backup, to add robustness to the system, and to handle a few expensive or hard-to-accommodate application: transitional places, ultra-low densities, etc.