

Special Issue

Adaptive Optics: Technology and Applications

Message from the Guest Editors

Adaptive Optics (AO) is commonly used in ground-based telescopes to restore spatial resolution in astronomical observations, which is lost due to the presence of the atmosphere. The very demanding requirements of these new, complex facilities have many synergies with other applications, such as Free-Space Optical Communications through the atmosphere. The benefits of optical links over radiofrequencies are namely the possibility to transfer information at a very high data rate, the very large available bandwidth, the security of the data transfer, and the required size, weight, and power for equipment. These benefits come at the cost of significant technical challenges that need solving. When crossing the atmosphere, optical beams suffer multiple distortions such as beam wandering, scintillation, phasefront distortion, and beam spreading. To mitigate these effects, several techniques such as adaptive optics, spatial diversity, and aperture averaging have been proven to be effective. These methods can also benefit other types of applications involving light propagation through the atmosphere, such as Space Surveillance and Tracking (SST).

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