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DATE: FEBRUARY 3RD, 2026
Time: 11:15 – 12:15
Venue: Seminar Room L4E48

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Oxygenic photosynthesis is one of the fundamental biochemical processes that shaped Earth's biosphere and atmosphere, typically relying on visible photons (400–700 nm) to drive charge separation and water oxidation, which imposes energetic constraints on the photochemistry of oxygenic organisms. However, a diverse group of cyanobacteria have evolved to utilize far-red light (700–800 nm), extending the range of usable solar energy. This is achieved through the incorporation of a handful of red-shifted chlorophylls into specialized paralogous subunits of their photosynthetic complexes, allowing these organisms to use lower-energy photons. The talk presents structural insights into the protein complexes expressed in far-red light in the cyanobacterium *Chroococcidiopsis thermalis* PCC 7203. Cryo-electron microscopy maps enabled precise localization of the red-shifted chlorophylls, including key pigments at the core of both Photosystem I and Photosystem II, and revealed a novel, far-red-exclusive Photosystem II subunit. This provides a framework for understanding the energetic and spatial organization of far-red light photosynthesis and provides insight for exploring the mesoscale arrangement of thylakoid membranes in this unique photoacclimatory state.

Hosted by Marine Structural Biology Unit
Oleg Sitsel