

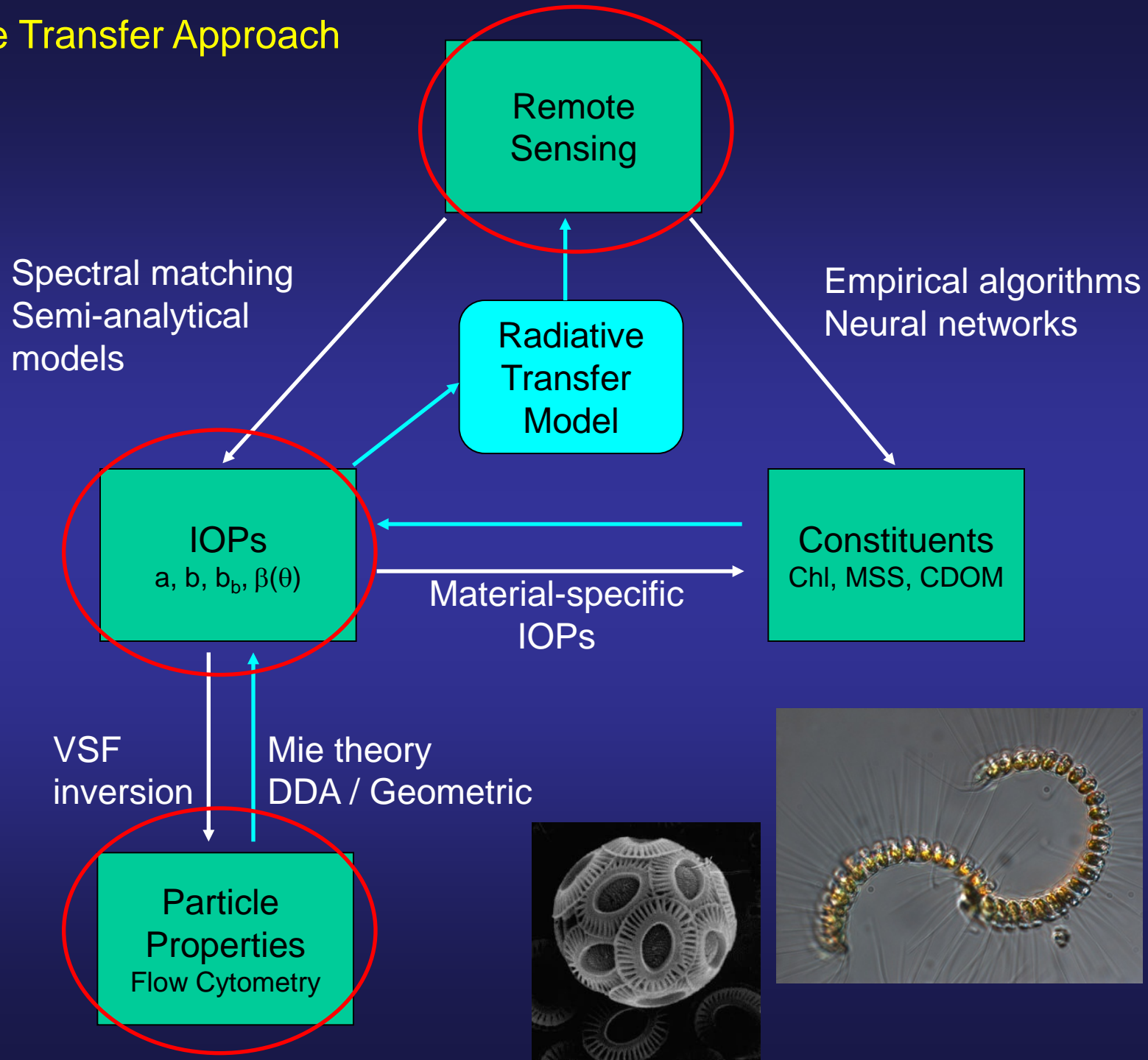
Marine Optics and Ocean Colour Remote Sensing

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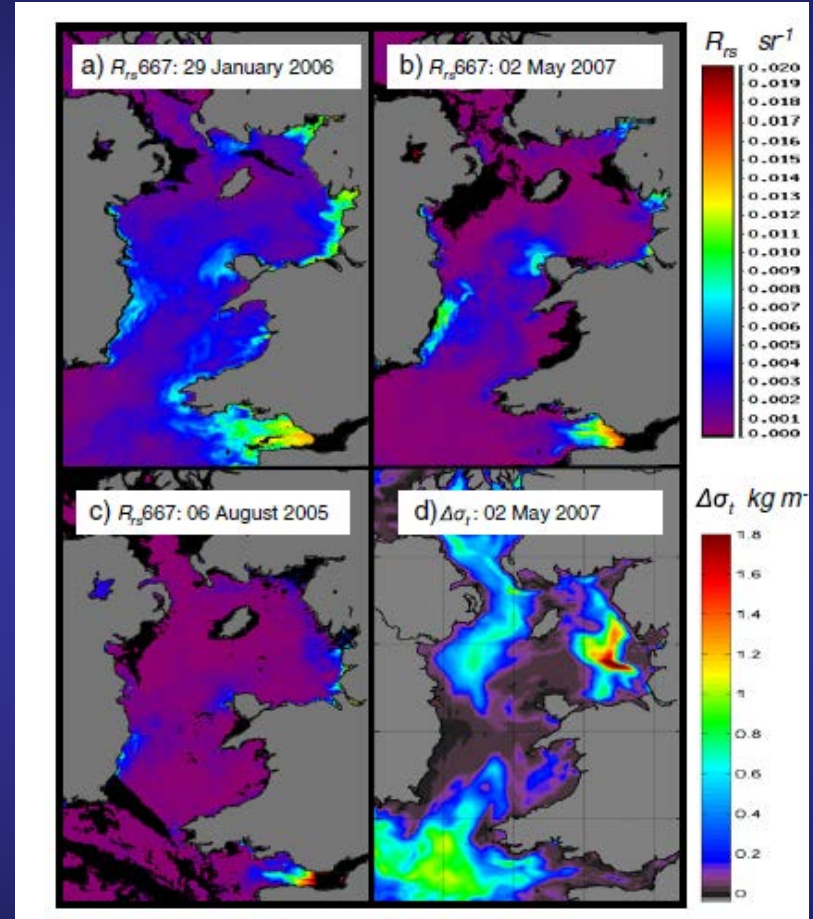
The Radiative Transfer Approach



Ocean Colour Remote Sensing: Dynamics and Ecosystems

- Using ocean colour to monitor water quality in optically complex coastal waters.
- Algal blooms and sediment plumes.
- Algorithm development and testing.
- Observing links between ecosystem behaviour and physical processes.
- Establishing active links with modelling community, e.g. NOC, NATO.
- Validation for ESA Sentinel 3.

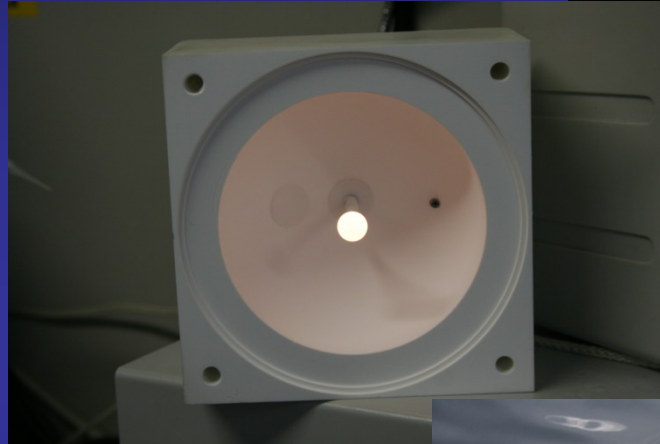
Neil et al. (2012) Remote Sensing of Environment 127: 288–297



Seasonal variations in remote sensing reflectance signals linked to sediment dynamics driven by mixing and stratification events

Optical Technology Development

- Radiative transfer approach demands accurate IOPs.
- Developing new corrections for existing instrumentation e.g. WETLabs ac-9.
- Working with international partners to further develop PSICAM technology.
- Exploiting innovations in quantum optics to develop new transmissometry solution.



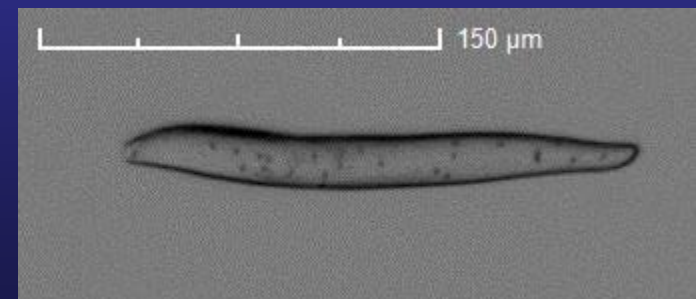
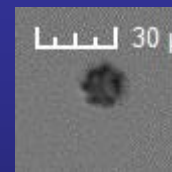
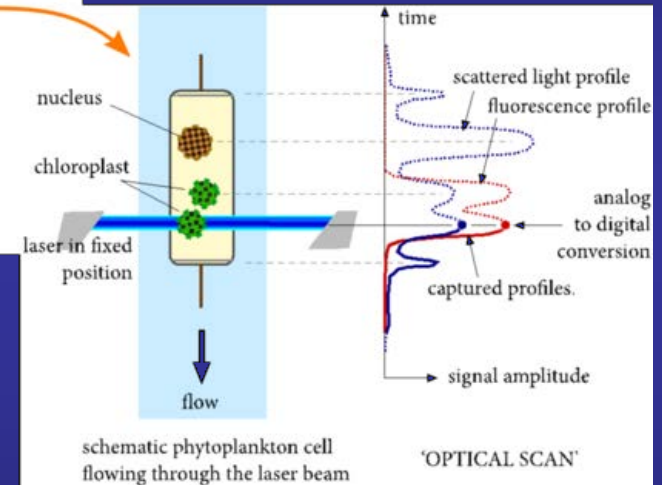
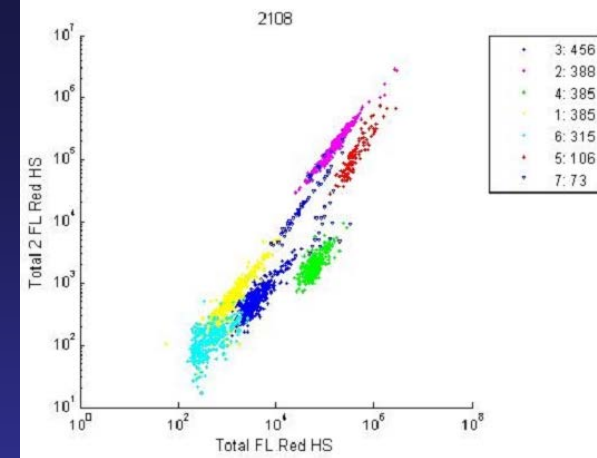
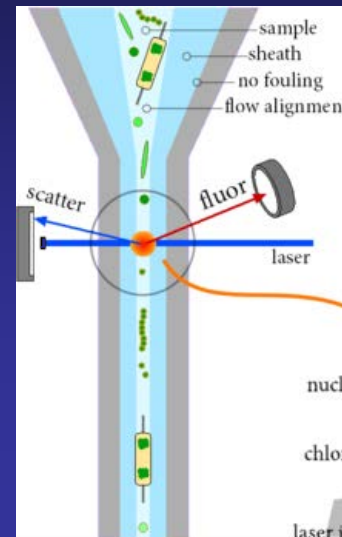
*PSICAM with HZG,
Germany*



In situ IOPs and sampling

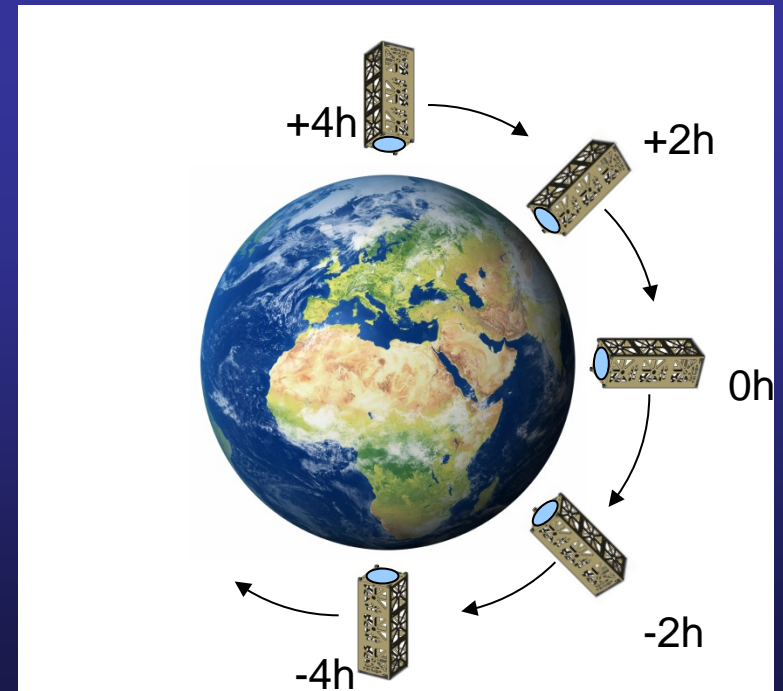
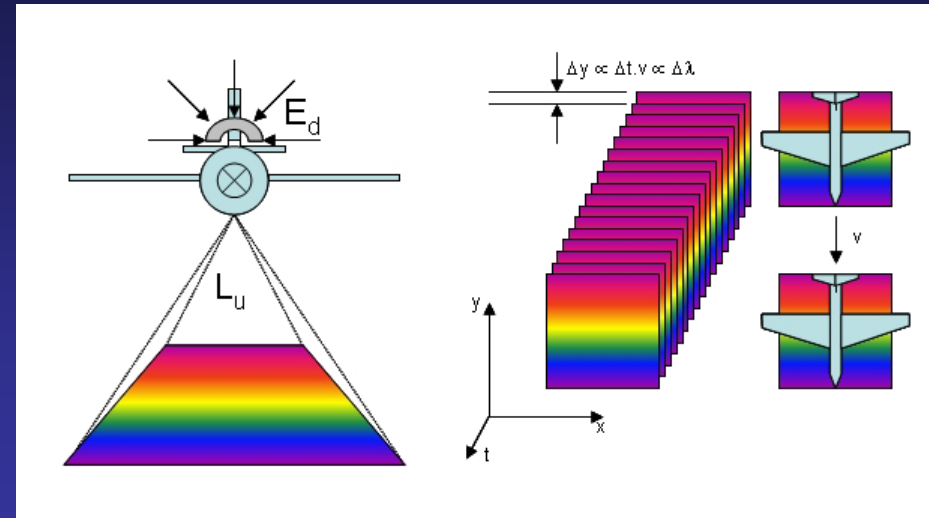
Particle Characterisation

- Cytosub submersible flow cytometer.
- Includes imaging capability.
- Particle composition.
- Particle size distribution (wide range).
- Link to IOPs via optical modelling.
- Taxonomic classification e.g. HABs



Remotely Piloted Aircraft and Cubesats

- Miniature hyper- / multi-spectral cameras for small RPAs (with SAMS, Oban).
- High spatial resolution for inshore and inland waters.
- HABs, pollution events, marine renewable sites, shallow benthic mapping, intertidal zone etc.
- Ice-edge, melt-ponds ??
- Possible stepping stone to CubeSat ?
- Growing Cubesat development community in central belt, e.g.
 - Strathclyde University (several)
 - Clyde Space Ltd
 - Astronomy Technology Centre



Arctic Ambitions

- Research focus is on optically complex waters, mainly coastal, and developing quantitative physics-based radiative transfer models.
- Rapidly changing Arctic climate and optical feedback mechanisms provides arena for high impact applications of the technology.
- Looking for opportunity to engage with experienced Arctic researchers with specific science questions that we could help to address.
- Keen to work with e.g. microbial biologists, physical oceanographers, technology developers e.g. autonomous platforms.