Thursday 19th November: 3-4pm

Name	**Institute**	**Poster Title**	**Abstract**
Louise Hamdy	Swansea University	Hydrophobic inclusion-induced void space for enhanced direct air capture of CO_2 by novel polyamine adsorbent	The direct air capture (DAC) of CO_2 is a potential negative emission technology to reduce atmospheric CO_2 concentrations. Polyamine-based adsorbents are effective for CO_2 capture from dilute sources due to their forming selective chemisorption interactions. However, their suitability for DAC is often compromised at relevant temperatures due to diffusion limitations preventing utilisation of internalised amines. This study presents the dramatic enhancement in ambient temperature CO_2 capture efficiency of a novel polyamine adsorbent resulting from the inclusion of hydrophobic functionality. Using positron annihilation spectroscopy, the origin of this enhancement is demonstrated to be in the induction of void space, opening diffusion pathways to enable greater amine- CO_2 interactions.
Mikhail Gorbounov	Brunel University London	Biomass Combustion Ash in Carbon Capture	The use of biomass in power generation is accompanied by the co-generation of a substantial amount of potentially hazardous waste - fly ash (FA). Biomass FA generally contains elevated concentrations of alkali and alkaline earth metals, suggesting an economical pathway to CO_2 capture and storage (CCS) via simultaneous carbonation and waste stabilisation. Employment of FA in post-combustion carbon capture from biomass power plants, not only facilitates the efficient valorisation of FA, but it also accelerates the development of negative emissions technologies. Here, we have investigated the physicochemical properties of industrial-grade UK-based biomass FA as a potential adsorbent for post-combustion CCS.

Grazia Leonzio	Imperial College London	Analysis and modelling of CO_2 adsorption from air	Direct air capture (DAC) has been proposed to capture CO_2 from air as a GHG mitigation and negative emissions technology. In this context, in this research work, detailed analysis of adsorption in a DAC system is undertaken, with the aim to compare chemisorption with physisorption. Three metal organic frameworks (MOFs) (MOF-177, MOF-5, MIL-101) and two amine functionalized sorbents (SI-AEATPMS, APDES-NFC-FD-S) are considered and modelled. Results show that the chemisorption ensures lower values of electric and thermal energy required per ton of CO_2 captured, comparable to those in the literature. Higher energy requirements are needed for the physisorption, due to lower equilibrium loading values, indicating that the latter is a critical parameter.