DOWNING COLLEGE

MCR SEMINAR NIGHT

THURSDAY 11TH NOVEMBER, 6PM, HOWARD THEATRE

LAURA HESKIN, PHD IN CANCER RESEARCH

Make do and mend: Salvaging data from damaged DNA to address obstacles in precision oncology

This century has seen an exciting shift in cancer treatment thanks to increased understanding of the human genome and cancer genetics. The discovery of key mutations underlying tumour growth and development has led to the introduction of precision oncology to the clinic. Sequencing DNA from a patient's tumour allows us to identify the cancer's specific vulnerabilities, which can then be exploited with targeted therapies. While this approach holds great promise in improving patient outcomes, reality has yet to meet our expectations. Join me as I explore some of the obstacles faced with targeted therapies, and how salvaging whole genome sequencing data from damaged formalin-fixed paraffin-embedded tumours may provide some solutions.

MADELEINE ROUOT, PHD IN INTELLECTUAL HISTORY

Alexis de Tocqueville and the Role of the Aristocracy in the Democratic Social State

Alexis de Tocqueville is often considered the first modern theorist of democracy. Yet, his observations on democracy were never made in isolation: they were always linked to complementary insights on aristocracy. Few studies have been devoted to a systematic analysis of the importance of aristocracy for Tocqueville. As a result, scholars have traditionally ascribed Tocqueville's constant references to aristocracy to the mere outcome of his aristocratic upbringing, and notably to his early reading of seventeenth-century French moralists and Jansenist education. Yet, in the 1820s, at a time when civil equality became an irreversible phenomenon, the question of aristocracy, and its link with liberty, inequality and local administration, was looming large in French political discourse. By recontextualising Tocqueville's work in the debate over the search for a new elite to fill in the void left by the collapse of the old nobility, my research will explore the way in which Tocqueville redefined aristocracy so as to include it in a postrevolutionary liberal theory of democracy. Ultimately, I intend to reconsider the position that views Tocqueville as a 'reluctant' Democrat engaged in a lifelong task of retrieving a receding aristocratic past in order to counteract the new forms of democratic despotism.

TOM NEWTON, PHD IN ENGINEERING

Does hot air always rise? The influence of a sloped surface on the motion of buoyant flow

Hot air rises. This fundamental physical principle is one we encounter frequently in the world around us. We are all familiar, for example, with the flow of steam produced from the spout of a boiling kettle, or the trail of smoke which travels upward into the sky from a campfire. The behaviour of such flows is already well understood, however their interaction with the environment around them is a subject into which limited research has been directed. In this experimental study we consider a flow of hot air emitting from a sloped surface, the angle of which can vary between 0° (horizontal) and 90° (vertical). Despite the simplicity of this problem, we observe a wide range of phenomena as the surface angle is varied, including two previously unknown flow behaviours. The findings of this work have potential applications in a multitude of 'real world' scenarios, spanning both the engineered and natural world. Foremost amongst these applications is improving the accuracy of predictions for the spread of wildfires across hilly landscapes.