Partial integro-differential equation models for the spatial spread and evolutionary dynamics of heterogeneous cell populations

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In this talk, partial integro-differential equation models describing the spatial spread and evolutionary dynamics of heterogeneous cell populations will be considered. In these models, a continuous structuring variable captures intercellular variability in cell proliferation and migration rates. A formal derivation of such deterministic, continuum models from corresponding stochastic, individual-based models will be carried out, analytical and numerical results summarising the behaviour of the solutions to the model equations will be presented, and the insights generated by these results into the mechanisms that underpin collective cell migration will be briefly discussed.