Contribution Title:	FROM THE GINZBURG-LANDAU MODEL TO VORTEX LATTICE PROBLEMS
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I will present a joint work with Etienne Sandier, where we study the behavior of vortices for minimizers of the 2D Ginzburg-Landau energy of superconductivity with an applied magnetic field, in a certain asymptotic regime where the vortices become point-like. In the regime of applied fields we are interested in, it is observed that vortices are densely packed and form triangular (or hexagonal) lattices named Abrikosov lattices. We derive rigorously from the Ginzburg-Landau energy, via methods of Gamma convergence, first a leading order "mean field model" describing the optimal density of vortices; second a next order limiting energy which governs the position of the vortices after blow-up at their inter-distance scale. This limiting energy is a logarithmic-type interaction between points in R^2. By using tools from number theory, it turns out that, among lattice configurations, this energy is uniquely minimized by the triangular lattice, thus providing a first justification of the Abrikosov lattice in this regime.