

PDEGP 2018

Synopsis and Organizers

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Partial Differential Equations in Geometry and Physics

PDEs are among the most powerful tools in both geometry and physics. Fundamental geometric problems like the Poincaré conjecture have been solved with PDEs, and the basic field equations of physics, like those of Maxwell or Einstein, are expressed in terms of PDEs. Usually, those PDEs involve some singularities. For instance, the boundary or the underlying space could be singular. Or the data or the PDE itself could have singularities. Most importantly, however, solutions of nonlinear PDEs can by themselves develop singularities. Understanding these singularities then is crucial for the underlying geometric or physical problem. In the last couple years, there are many exciting advances in these areas. We want to bring together some of the contributors from China and abroad to take account of what has been achieved, what methods and techniques are available, and most importantly, to set the stage for future advances. The invited participants will have different knowledge and different backgrounds, ranging from abstract and nonlinear analysis to geometry and mathematical physics. This should help us to further explore new connections between analysis, geometry, and physics, in particular quantum field theory and related fields.

Organizers

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