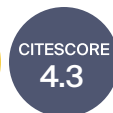




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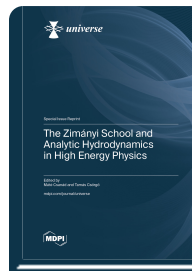
The Zimányi School and Analytic Hydrodynamics in High Energy Physics

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In collisions of relativistic heavy ions, specific circumstances (energy density, temperature, and pressure) allow for the emergence of a matter that is similar to the one that filled the universe in the first few microseconds. At present, this matter is called the strongly interacting quark–gluon plasma (sQGP), and since it becomes locally thermalized quite early, equations of hydro- and thermodynamics can be utilized to describe its time evolution. Hydrodynamics is a theory that has no internal scale; hence, it can be applied to systems of vastly different sizes, and sQGP is one of them. Analytic solutions utilizing the speed of sound and transport properties shed light on special connections between the final and initial state properties of this matter. Zimányi and his collaborators were among the pioneers of this sub-field, and hence, it is one of the main topics of the annual Zimányi School Winter Workshops. In this reprint, we include papers that address the analytic aspects of hydrodynamics and utilize them to describe sQGP. Furthermore, we include papers that were presented at the Zimányi School 2018 on topics such as effective theories, diffraction, femtoscopy, heavy flavor physics, jets, lattice QCD, the search for the QCD critical point, or vorticity in heavy-ion collisions.



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