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Forum de Physique Statistique @ ENS

Mercredi 12 Octobre 2022, 12 :00
LPENS, L369
Domaines : cond-mat.stat-mech

Titre : *Phase transitions in Turbulence*

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Résumé :

Turbulent flows are characterized by the transfer of energy across scales either towards smaller scales (forward cascade) or to larger scales (inverse cascade). Recent work has revealed that in many configurations turbulence deviates from the ideal cases of strictly forward cascade

observed in three-dimensional turbulence or the strictly inverse cascade observed in two-dimensional turbulence. In the presence of confinement, rotation, stratification or magnetic fields the cascade can change direction and possibly display a split cascade where energy cascades to both small and large scales simultaneously. Furthermore, in many cases the transition from forward to inverse cascade can be critical allowing us to talk about different "phases of turbulence".I will give a short summary of these recent results focusing on the behavior of turbulence near the critical points and present the open questions that demand a statistical-physics answer.