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Pipeline Fluid Mechanics 2020

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Message from the Guest Editor

The fluid flow dynamics through a pipe is a basic fluid mechanics problem, which occurs in many industrial applications. This basic geometry is not only found in the transportation of goods and/or materials, such as oil, gas, and water, but also used as a building block to model more complex flows, such as those in teleheating systems, heat exchangers, mixing chambers, product changeover, as well as in biomedical applications. Though simple in geometries, they possess very fundamental yet complex fluid flow physics with practical importance.

For instance, for internal flow in pipes, a curvature may cause a dean flow, and/or with internal perturbation/friction, the flow may undergo laminar to turbulent transition. This significantly alters the pressure head loss, mixing, as well as wall heat transfer. Alternatively, a multiphase or an aggressive fluid flow inside a pipe may cause fluid-induced vibration and/or corrosion, pipe failure, and, as a consequence, an environmental hazard. Flow around the pipelines may also cause vortex-induced vibrations and affect other nearby pipes and infrastructure.



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Message from the Editor-in-Chief

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