

Abstract Submitted  
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**Is Chaotic Advection Inherent to Porous Media Flow?** DANIEL LESTER, GUY METCALFE, MIKE TREFRY, CSIRO — All porous media, including granular and packed media, fractured and open networks, are typified by the inherent topological complexity of the pore-space. This topological complexity admits a large number density of stagnation points under steady Stokes flow, which in turn generates a 3D fluid mechanical analogue of the Baker's map, termed the Baker's flow. We demonstrate that via this mechanism, chaotic advection at the pore-scale is inherent to almost all porous media under reasonable conditions, and such dynamics have significant implications for a range of fluid-borne processes including transport and mixing, chemical reactions and biological activity.

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