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## The role of anisotropy in oceanic lithosphere from 'cradle to grave'

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The oceanic crust and lithosphere are commonly treated as geologically simple, their fundamental properties encapsulated by the 1D model of layered oceanic crust and the plate-cooling model of lithospheric thickness we learnt as undergraduates. The question of directionality or anisotropy in the behaviour and deeper structure of oceanic plates is relatively rarely considered, despite formation processes, such as rifting and seafloor spreading, and surface topography, such as abyssal hills, that are clearly highly anisotropic. In this presentation, we bring together evidence from a variety of sources from regional studies of rifting and volcanism to numerical modelling and global analyses of bathymetry and gravity data. We show how anisotropy is imprinted into the oceanic lithosphere at formation, both in the early rifting phases and at mature spreading centres, and how that anisotropic signature persists for many millions of years, potentially strengthened by preferential alignment of mineral phases as the moving plates cool and thicken. We then consider how this directionality impacts later deformation, volcanism, and eventually subduction.