MIP: PARADIM at Cornell University, DMR-1539918

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# Pushing boundaries: High pressure, supercritical optical floating zone materials discovery

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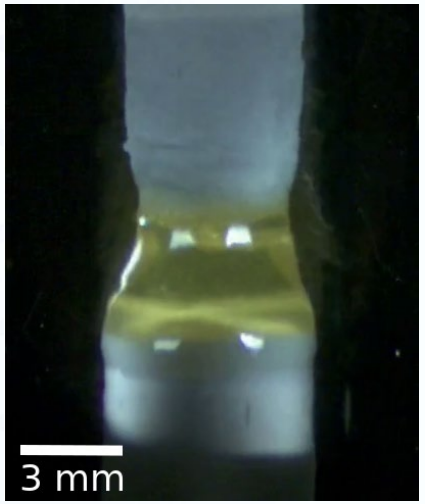
An invited perspective highlighting research in the high pressure domain at PARADIM was recently published in the *Journal of Solid State Chemistry* as part of a 50th anniversary special edition.

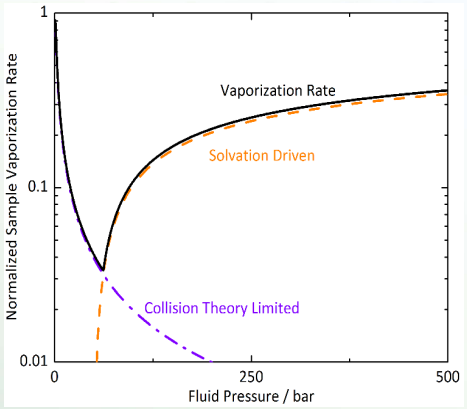
PARADIM major achievements include stabilizing the first dynamic fluid pressure 300 bar and first 150 bar traveling solvent molten zone (top figure). Fluid pressures are a much unexplored frontier that will continue to yield new discoveries.

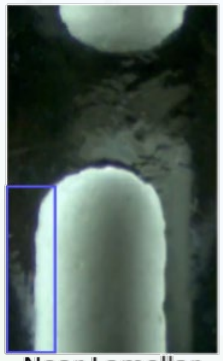
Misconceptions about fluid pressure interactions with samples were addressed. Increased pressures do ***not*** always yield a reduction in sample vaporization as commonly assumed. This is due to the enhanced solvation properties of the fluid at higher pressures.

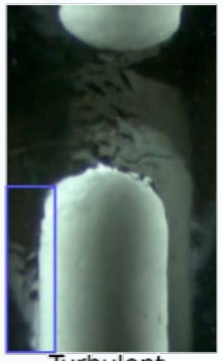
There is still much to be understood about materials synthesis at fluid pressures pioneered by PARADIM (e.g., oscillations between lamellar and turbulent flow). Being able to model these behaviors will allow for control of these effects, which will lead to accelerated materials discovery.

Raw data from the project was made available in accordance with PARADIM's data vision.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