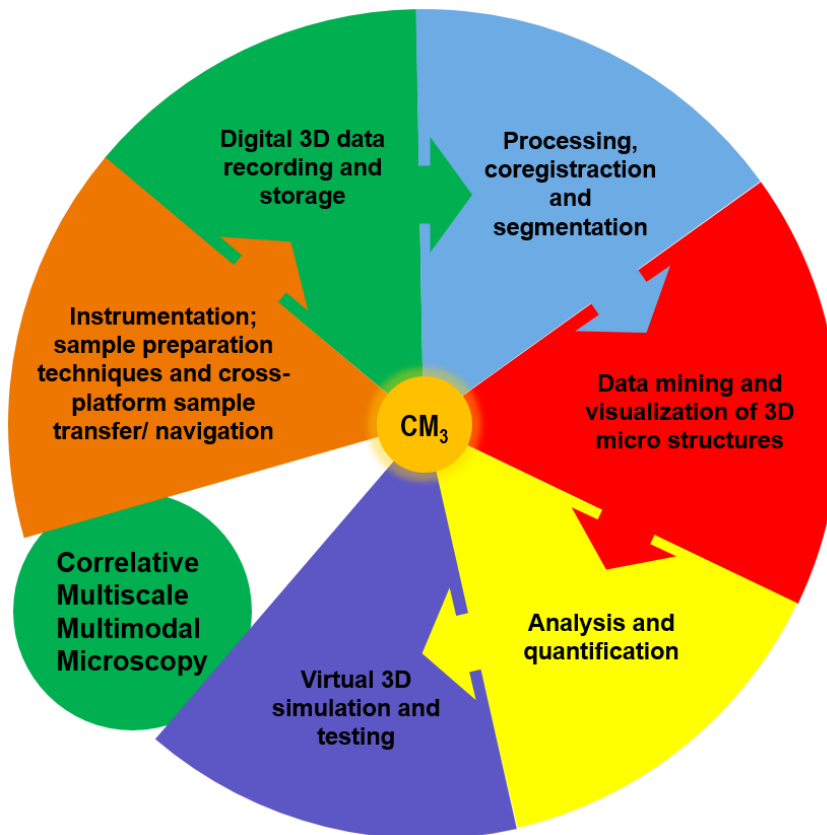


## Advances in 3D Correlative Multiscale Multimodal Microscopy

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Three-dimensional correlative multiscale multimodal microscopy, also known as correlative multiscale tomography, is a dynamically developing complex materials science and life science research strategy. It's modular design incorporates six major workflow steps: a) instrumentation/experimental, sample preparation techniques and cross-platform sample transfer/navigation, b) digital 3D data recording and storage, c) processing, coregistration and segmentation, d) data mining and visualization of 3D micro structures, e) analysis and quantification and f) virtual 3D simulation and testing.



In this contribution we demonstrated advances in the 3D correlative microscopy accelerated with latest HeliScan™ micro CT system, Helios™ PFIB - SEM DualBeam™ microscope and unique, software integrated instrumental environment using inter-linked software: Auto Slice&View 4™, Avizo™, iFAST™, Maps™ and AutoScript™. As practical examples we investigated micro-structural imperfections, cracks and local residual stresses developed in additively manufactured IN718 sample via blown powder direct laser deposition. The combined capabilities of hardware and software allowed obtaining a new insight into manufacturing defects developed during direct laser deposition.