

01 - Quartz habits and secondary pseudomorphs from secondary filled lenses in triassic grey Wesersandstein

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The grey Wesersandstein from Germany is a typical triassic feldspatic sandstone containing some secondary modified lenses with lower density and interesting mineralogical features. These lenses contain some secondary pseudomorphs of quartz after halite.

These lenses, from 1mm to 1cm in the sandstone are interpreted by a diagenetic process during which some original NaCl formation is replaced by other sodium containing minerals like Albite. Also Halite is replaced by SiO₂ (release from the alteration of feldspars). Figure 1 shows a typical slab with the various secondary filled lenses. The grey Wesersandstein is actually used as building and construction material for many applications.

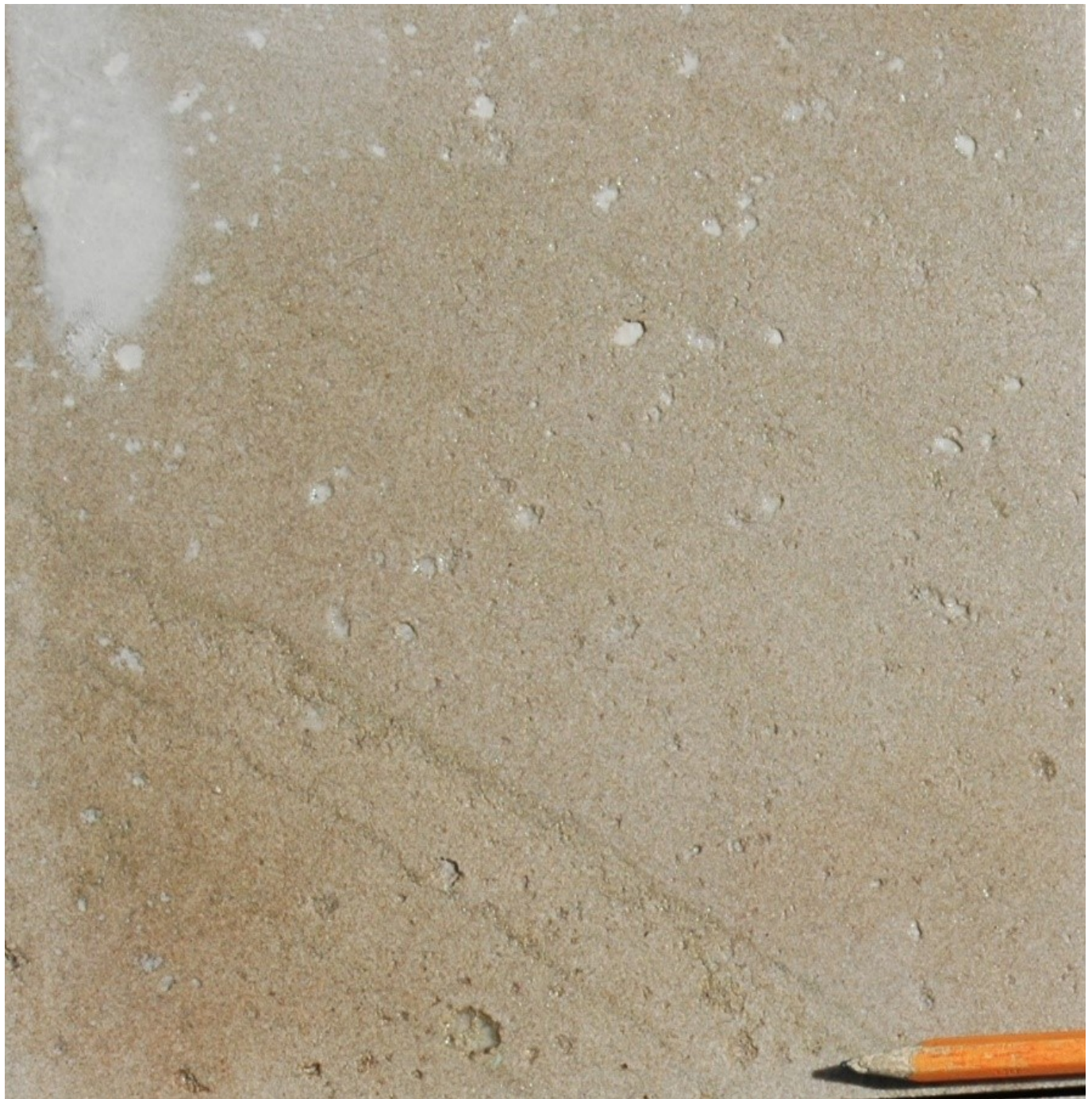


Fig. 1: Slab of grey Wesersandstein with various secondary filled lenses with lower density

Due to this fact different grains and crystals of quartz occur in the feldspar.

1. Original quartz grains of the sandstone
2. Secondary authigenic quartz crystals
3. Pseudomorphs of quartz after halite-crystal (hexaedic habit)
4. Typical etching cavities due to weathering effects

The following images show the different quartz habits and formations in the grey Wesersandstein

formation.

In the performed investigations for investigation of probable usage of Wesersandstein as a potential storage material, these different quartz crystals can have different geochemical and geomechanical properties. The formation and habit also differs from their varying origin. Almost rounded quartz grains in the sandstone, newly crystallized idiomorphic quartz and also pseudocubic and pseudomorphic quartz. Some newly formed quartz crystals show already etching pits as their faces are already under the influence of starting dissolution.

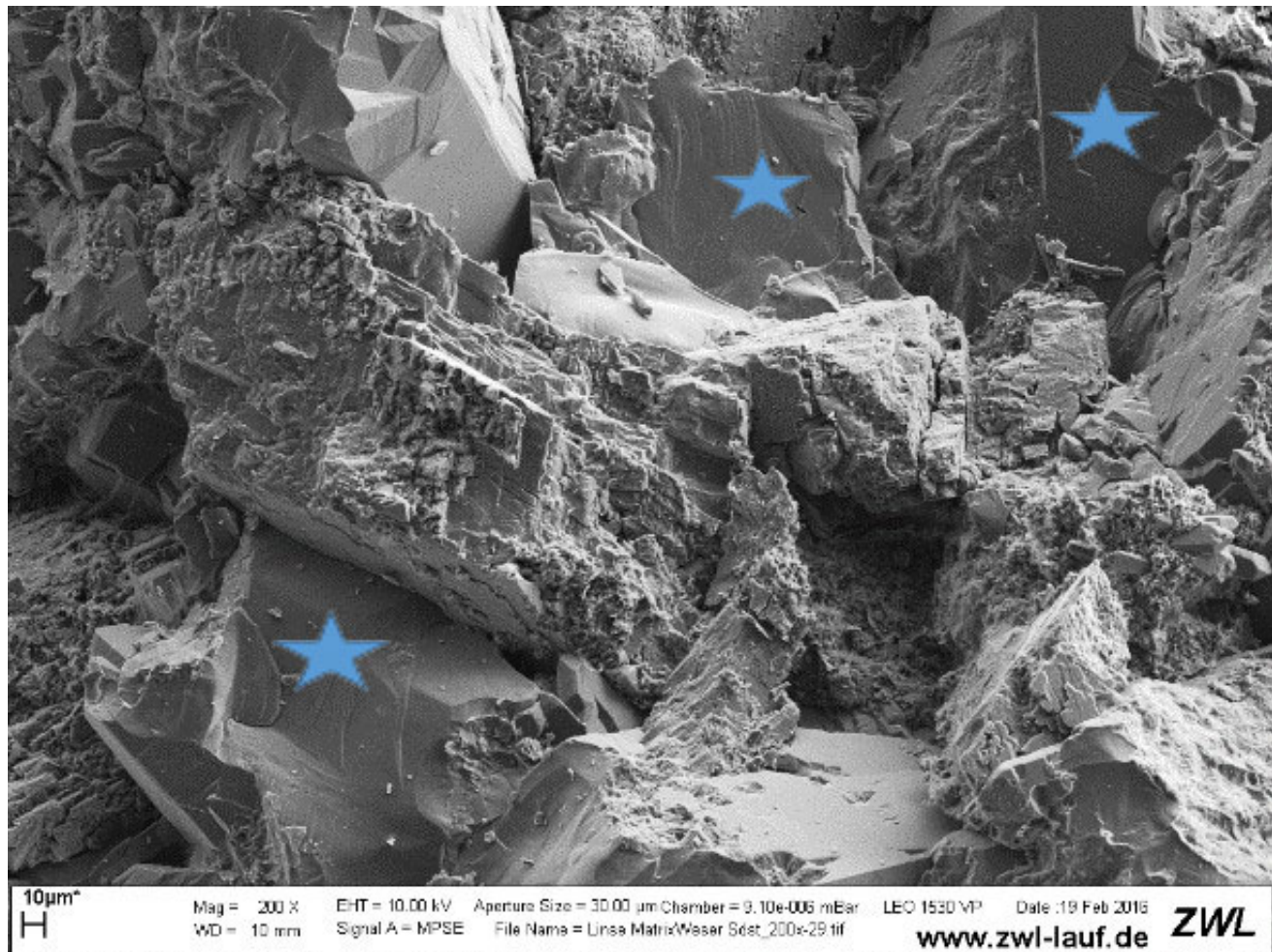


Fig.2: Smooth surfaces of quartz grains in the grey Wesersandstone

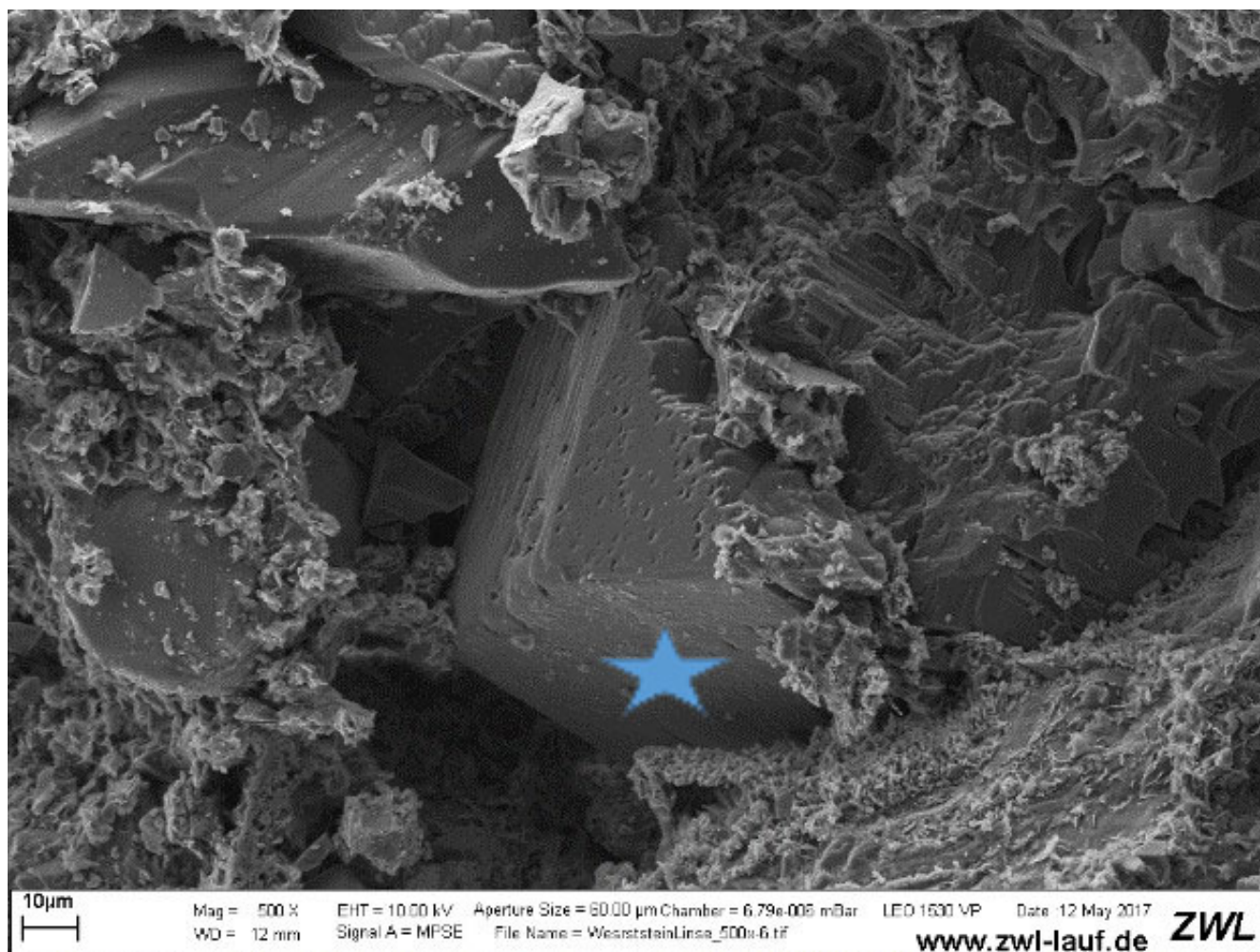


Fig.3: Partially regrown quartz with trigonal etching cavities

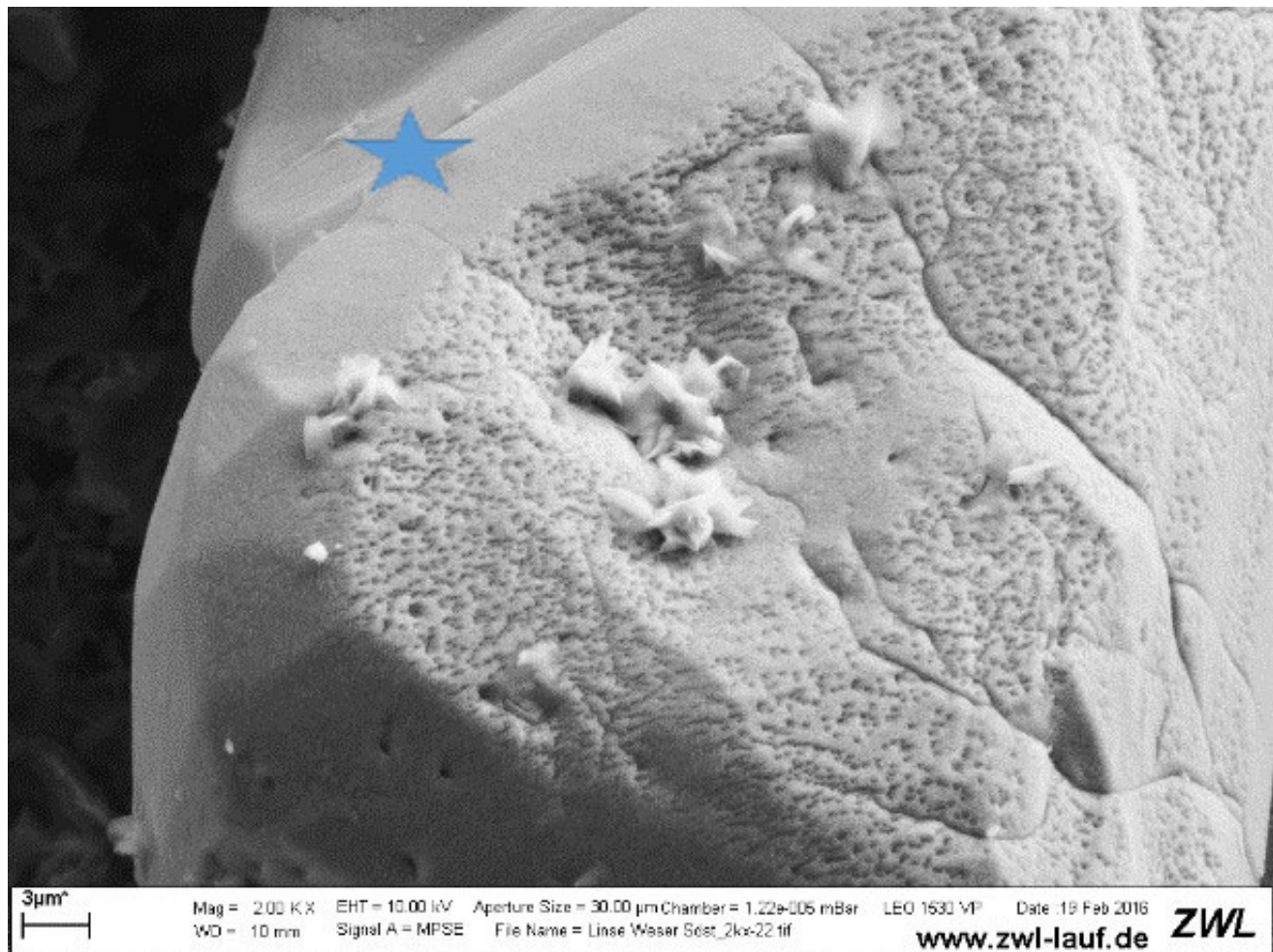


Fig.4: Typical etching cavities on quartz crystals

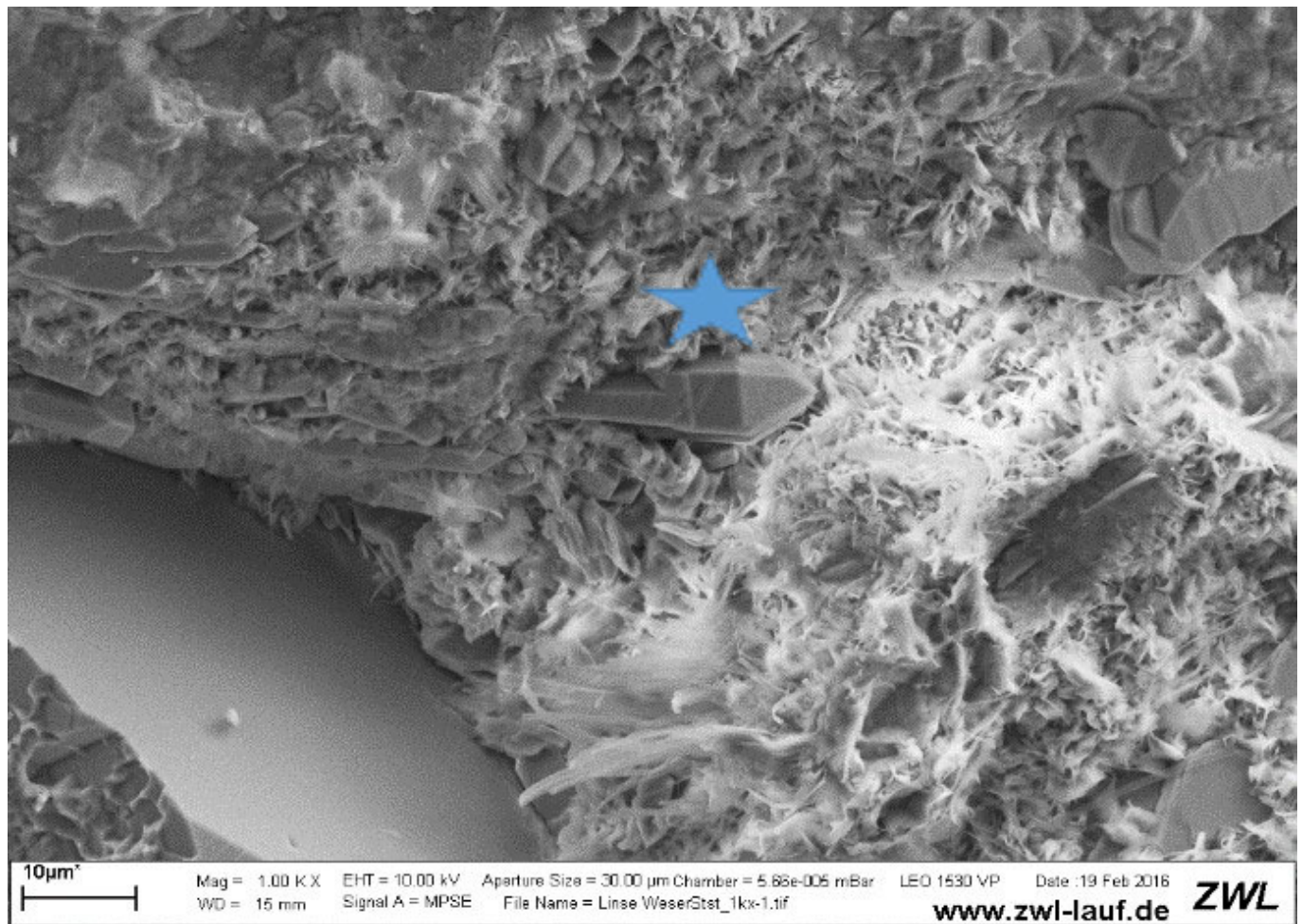


Fig.5: Authigenic quartz crystal covered with platey clay minerals

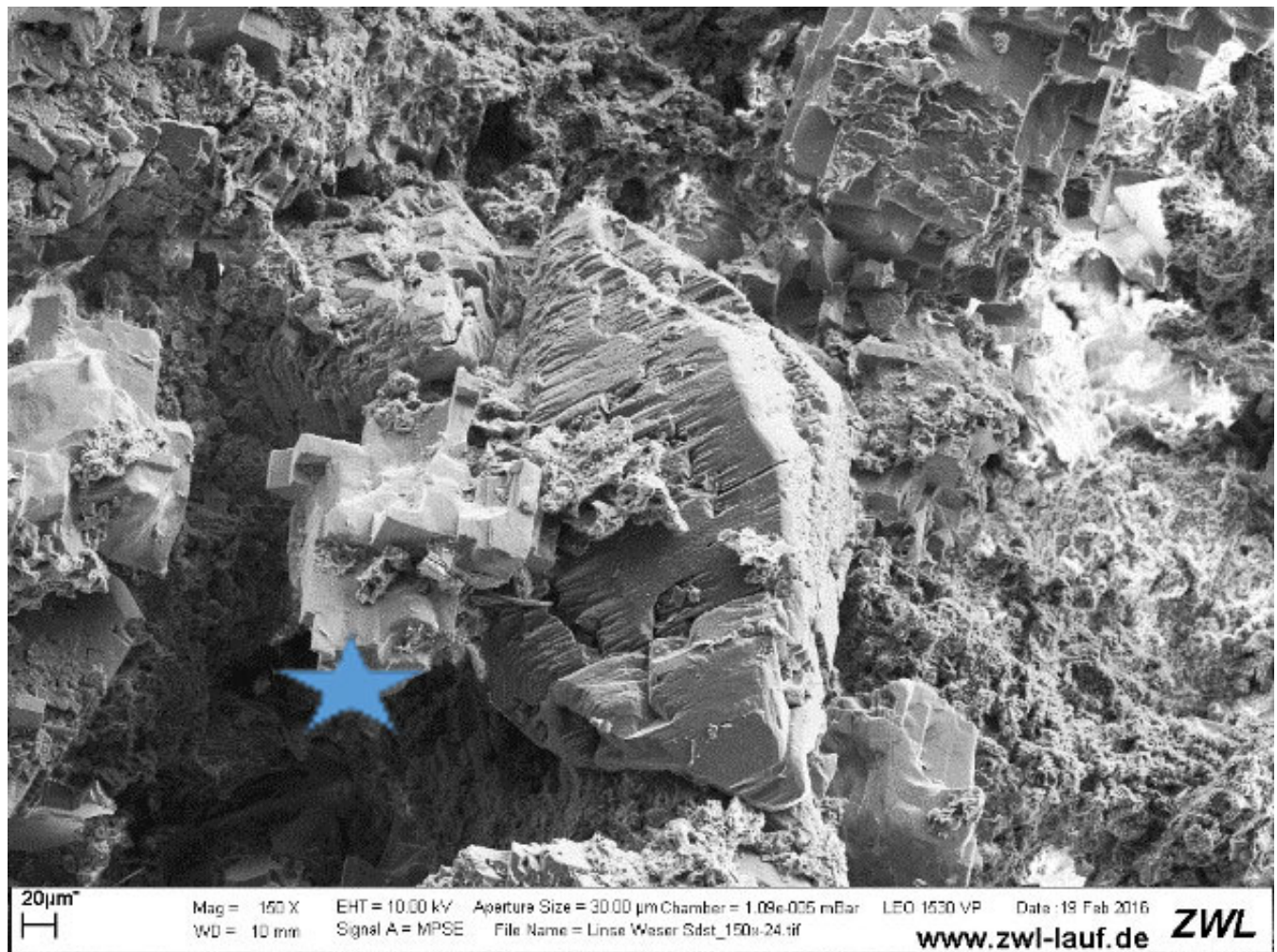


Fig.6: Aggregate of pseudocubic quartz in secondary mineral lenses

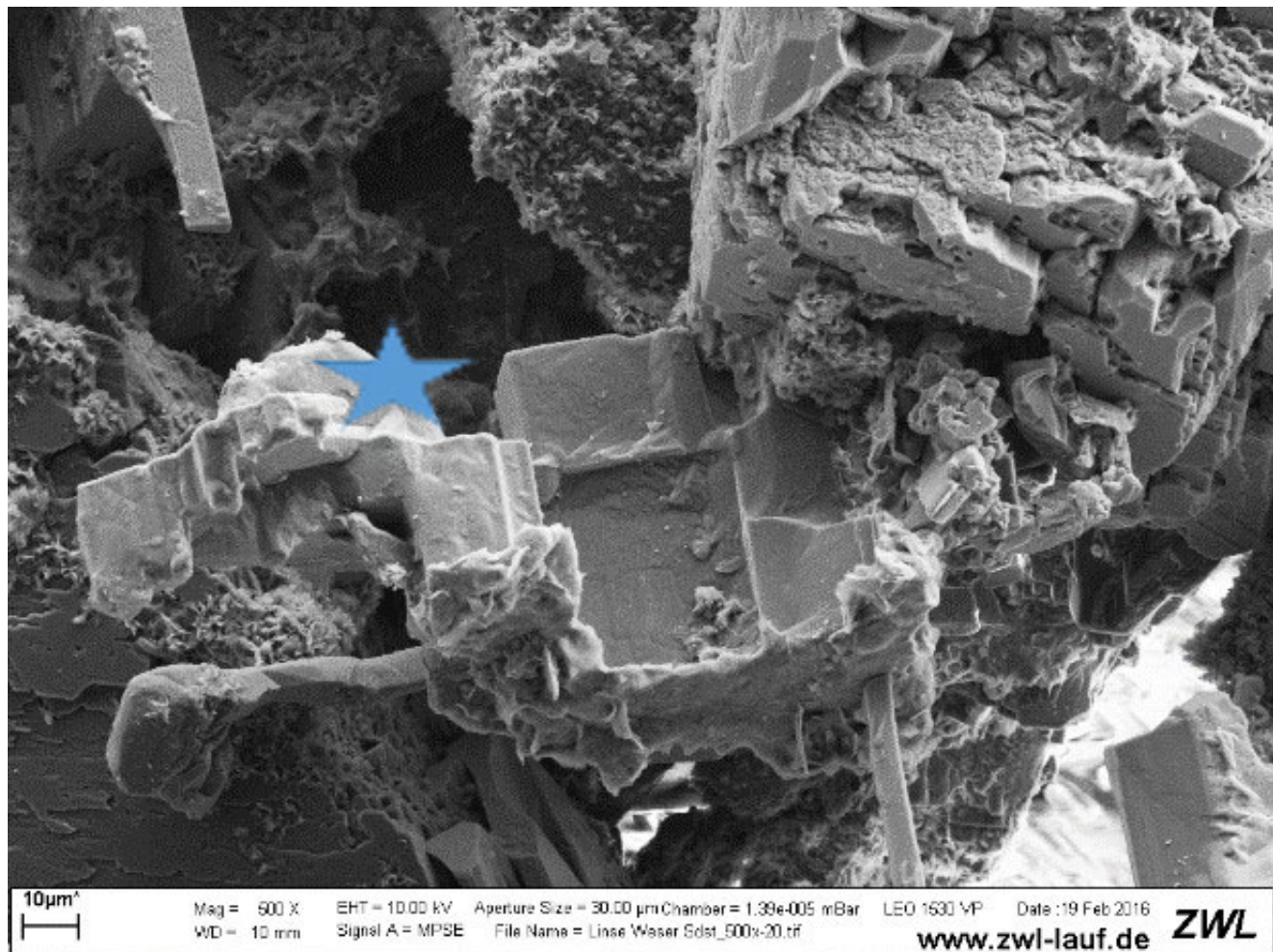


Fig.7: Pseudocubic and lathy quartz crystals



Quartz in the SEM images

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