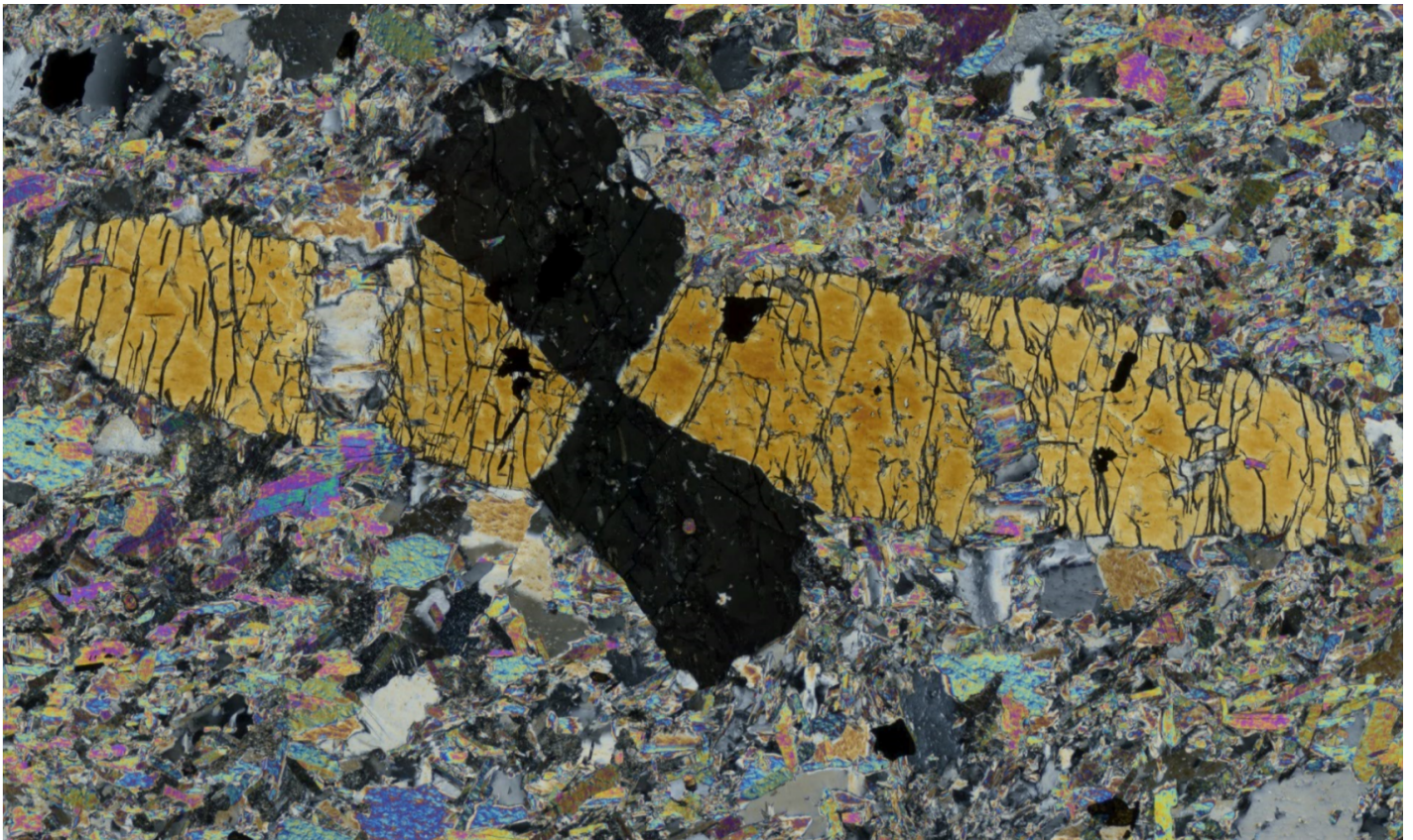


Mineralogical Society



Metamorphic Studies Group

**40th anniversary
Research in Progress meeting**



29–31 March 2021

MSG 2021 CONFERENCE - SCHEDULE

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Notes:

*Keynote/invited/prize talk (30 minutes)

All times = British Summer Time = BST = GMT+1

All sessions hosted on Zoom except for the poster sessions, which will be on Gather.Town

Permian nappe tectonics and high-grade metamorphism related to Gondwanide Orogeny in northern Patagonia terrane

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⁷Helmholtz-Zentrum Dresden-Rossendorf, Helmholtz Institut Freiberg für Ressourcentechnologie, Freiberg, Germany.

The focus of this contribution is to characterize a sequential order of deformational structures and associated metamorphic conditions of the igneous-metamorphic basement rocks from northern Patagonia terrane (41°28'30"S-65°40'30"W). Based on field mapping, mesoscopic structures are analysed to evaluate progressive and polyphasic deformation, developed under regional high-grade metamorphism.

Three continuous deformational phases are recognized. During D₁ phase, the formation of overturned tight F₁ folds is associated with penetrative axial plane foliation S₁. It exhibits P-T conditions close to the baric peak, and likely represents the progressive metamorphic stage associated with syn-kinematic growth of garnet-kyanite porphyroblasts in meta-pelites. D₂ phase is recorded as either shear bands S₂ transposition or mylonitic foliation, coeval with polymorphic transformation of kyanite to sillimanite owing to thermal peak. A nappe system related to kilometer-scale El Jagüelito ductile shear zone characterizes the large-scale D₂ structure of the investigated area. D₃ phase is distinguished by refolding of the former fabric and formation of either kink-bands or crenulation cleavage S₃ of the S₁-S₂ foliation planes, under retrogressive metamorphic conditions. The nappe system exhibit a top-to-the S/SW tectonic transport, and the El Jagüelito shear zone served as a right lateral ramp in the exhumation process among D₂-D₃ events.

Petrographic analyses of metamorphic mineral assemblages and reaction textures combined with conventional geothermobarometric estimates and a pseudosection records the pressure-temperature conditions of metamorphism among D₁-D₃ events. In situ electron probe Th-U-Pb monazite dating of 272, 260, and 251 Ma constraints the main tectono-metamorphic event to Late Permian Gondwanide Orogeny.

New results combined with existing geological and geochronological constraints allow inferring a clockwise P-T-D-time evolutionary path within the kyanite-sillimanite stability fields. Comprehensive regional comparison of the large-scale structural framework is indicative of an ongoing oblique subduction beneath the proto-Andean margin of Gondwana in the NE direction. This continental subduction and exhumation lasted at least 20 million years, nearly the entire Guadalupian-Lopingian series, producing transpression and metamorphic conditions of amphibolite-to-granulite facies, in medium- to high-pressure regimes, although the studied area occur in a back-arc to intracontinental settings. Geotectonic implications also includes a long-lived tectono-metamorphic history of the El Jagüelito shear zone, which was formed during Early Paleozoic and successively reactivated during Permian and Jurassic times.