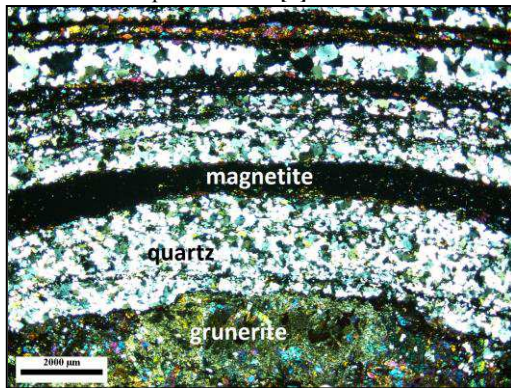


## Initial mineral phases of banded iron formations

RUPAM GHOSH<sup>1</sup>

<sup>1</sup>Department of Geological Sciences, Jadavpur University, Kolkata, India. (Email id: rupamkumarsp@gmail.com)

Banded iron formations (BIFs) are Precambrian chemical sedimentary rock having alternative Fe- and Si- mineral rich bands. The initial mineralogy and process of alternating band formation in BIF are highly controversial subjects. Because, the initial mineral phases of all BIFs were mostly altered by subsequent diagenesis and metamorphism. There are two schools of thought regarding the earliest precipitating phases, such as, i) separate precipitation of Fe- and Si- phases with temporal variation [1] and ii) co-precipitation Fe and Si as Fe-silicates and subsequent decoupling of Fe and Si with the formation of separate bands [2].



**Fig.1.** photomicrograph of magnetite-, quartz- and grunerite-bands in BIF.

Some rare BIFs in Badampahar greenstone belt, East Indian shield contain grunerite rich bands along with magnetite- and quartz- rich bands (**Fig.1**). Petrographic studies clearly suggest that the grunerite bands were not formed by reaction between magnetite and quartz. This is evident by the absence of grunerite bands in between quartz- and magnetite- bands. Grunerite was plausibly formed from a Fe-silicate precursor which was the result of Fe and Si co-precipitation. Whereas, the precursor of magnetite and quartz were not Fe-silicate phases. If Fe and Si were decoupled during diagenesis, the grunerite bands could not be formed. The precipitation of Fe-, Si- and Fe-silicate- bands were possibly driven by temporal changes in ambient physicochemical conditions. Trace elemental and isotopic mineral chemistry are being done to reveal the enigma of compositionally different band formations in BIF.

[1] Bau and Alexander (2009) *Precamb. Res.* 174, 337-346, [2] Rasmussen et al. (2013) *Geology.* 41, 435-438.