Garnet peridotite (assemblage ND1) has an inequigranular texture, in which large, irregular garnet grains (≤7 mm) are set in a fine-grained matrix (0.5–1.0 mm) of equant olivine, orthopyroxene, clinopyroxene, and garnet (Fig. 10A). Except for extensive serpentinization, post-garnet recrystallization is limited, consisting of thin kelyphite rims of fibrous spinel and amphibole around garnet (assemblage ND2, visible as dark fringes around garnet in Fig. 10A). Mg #'s are 90.3–91.1 for olivine, 91.0–91.4 for orthopyroxene, 90.0–91.1 for clinopyroxene, and garnet contains 69.9–72.9 mol% pyrope. Pyroxenes are much less aluminous than those in the Mohelno peridotite (Fig. 6), due to equibration with garnet at significantly higher pressures.

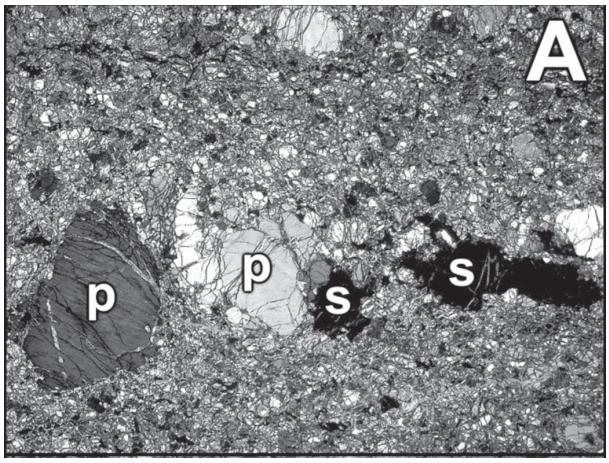
Eclogite typically has a medium-grained, granoblastic, slightly foliated texture (Fig. 10B), and some samples display prominent layering of garnet and clinopyroxene (see Fig. 2 in Medaris *et al*., 2006a), which is parallel to foliation in the surrounding peridotite. The most common assemblage in eclogite is garnet, clinopyroxene and accessory rutile, although some samples also contain orthopyroxene or kyanite. Garnet is intermediate in composition, varying among samples from $Prp_{55}Alm+Sps_{20}Grs_{25}$ to $Prp_{30}Alm+Sps_{40}Grs_{30}$, and clinopyroxene has a wide range in jadeite content, 10-50 mol%. P-T estimates for orthopyroxene eclogite, garnet websterite, and kyanite eclogite range from ~30 kbar, 800 °C to 47 kbar, 1100 °C (Nakamura et al. 2004; Medaris et al., 2006a), which lie within the field gradient defined by Nové Dvory garnet peridotite (Fig. 9).

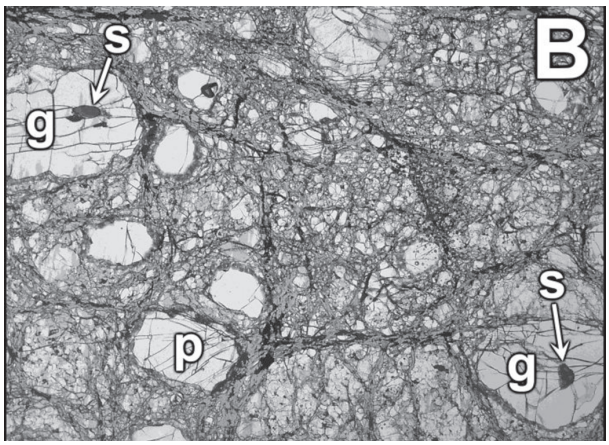
Eclogite and garnet pyroxenite layers in the Nové Dvory and similar peridotite bodies have a wide range in elemental (major and trace) and isotopic (Nd, Sr, and O) compositions. Based on geochemical modelling, Medaris et al. (1995) demonstrated that such variation could be explained by high-pressure crystal accumulation (± trapped melt) from transient melts in a mantle wedge above a subduction zone, with a component of such melts being subducted, hydrothermally altered oceanic crust. In contrast, Obata et al. (2006) suggested that kyanite eclogite in the Nové Dvory body represents oceanic crust (cumulus gabbro) that was subducted, transformed to eclogite, and tectonically juxtaposed with garnet peridotite.

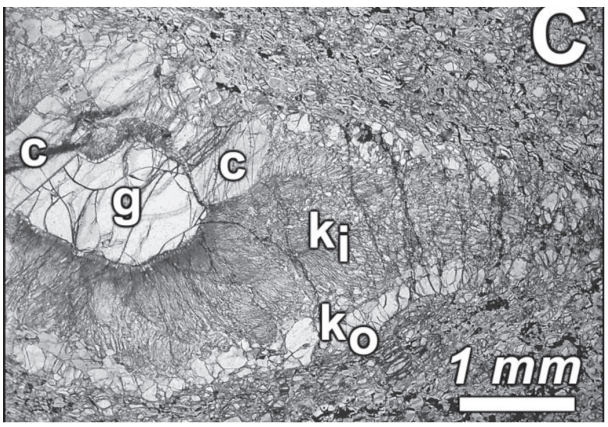
Stop 6-2 (Day 6). Mohelno Spinel Peridotite, Outcrop along the North Bank of the Jihlava River, ~870 m Upstream from the Highway 392 Bridge

Coordinates: N49°06′21.0″ E16°11′12.9″

This outcrop is representative of spinel peridotite that constitutes the interior and bulk of the Mohelno body. Although not visited during the excursion, note that the large Biskoupky peridotite to the east (Fig. 1) is a companion to the Mohelno peridotite and shares all the same characteristics.







■ **Fig. 11.** Photomicrographs of Mohelno peridotite samples; the scale in each panel is the same. A. Porphyroclastic spinel peridotite; crossed polarizers. B. Porphyroclastic garnet peridotite; note spinel inclusions in garnet; plane polarized light. C. Garnet surrounded by an outer, fine-grained kelyphite (assemblage M3, spl+opx+cpx) and an inner, symplectitic kelyphite (assemblage M4, spl+opx+amp); plane polarized light. Abbreviations: c, clinopyroxene; g, garnet; k_i, inner kelyphite; k_o, outer kelyphite; p, orthopyroxene; s, spinel.

Peridotite at this locality contains a porphyroclastic M1 mineral assemblage (ol+spl+opx+cpx), in which medium- to coarse-grained pyroxene and spinel porphyroclasts reside in a fine-grained, recrystallized matrix (Fig. 11A). The peridotite exhibits a pronounced foliation, parallel to which are several cm-scale spinel pyroxenite layers and lenses. The crystal-preferred orientation (CPO) of olivine in coarse-grained spinel peridotite shows a strong concentration of [100] subparallel to mineral lineation, with [010] and [001] girdles normal to lineation, reflecting an {0kl}[100] deformation mechanism (Kamei et al., 2010).

Minerals in the M1 assemblage are magnesian, with the following Mg #'s [100× Mg/(Mg+Fe)]: olivine, 88-91; orthopyroxene, 89-91; clinopyroxene, 90-94; and spinel, 72-77. The pyroxenes are Cr-bearing and relatively aluminous, containing >5 wt% Al_2O_3 (Fig. 6). Spinel is also aluminous, being similar in composition to disseminated spinel in abyssal peridotites, with Cr #'s [100×Cr/(Cr+Al)] ranging from 13 to 19. Based on the host compositions of exsolved pyroxene porphyroclasts, samples of spinel peridotite yield *minimum* temperatures of ~1100 ºC (two-pyroxene geothermometry, Taylor, 1998; Al-in-orthopyroxene geothermometry, Witt-Eickschen and Seck 1991), and based on the compositions of spinel, *maximum* pressures of ~21-22 kbar (O'Neill, 1981).

Stop 6-3 (Day 6). Mohelno Garnet Peridotite, Outcrop along the North Bank of the Jihlava River, ~130 m Downstream from the Highway 392 Bridge

Coordinates: N49°05′55.4″ E16°11′48.9″

Illustrated at this locality is the M2 mineral assemblage (ol+grt+opx+cpx), which has an inequigranular texture with large spheroidal grains of garnet and pyroxene (up to 7 mm) set in a fine-grained matrix of olivine, pyroxene, and spinel (0.2–0.5 mm). An important feature is the common occurrence of spinel inclusions in garnet (Fig. 11B). Typically, garnet is separated from olivine by a compound kelyphite, consisting of the M3 assemblage (spl+opx+cpx) in an outer zone and the M4 assemblage (spl+opx+am) in a fibrous, inner zone (Fig. 11C).

In contrast to the olivine fabric in spinel peridotite, the CPO of olivine in garnet peridotite shows a strong concentration of [010] normal to foliation and a concentration of [100] parallel to the lineation (Kamei et al., 2010), which is ascribed to an (010)[100] deformation mechanism.

As in the M1 assemblage, minerals in the M2 assemblage are magnesian, including garnet, which contains 82.5–84.3 mol% pyrope. M2 orthopyroxene contains less Al_2O_3 than that in spinel peridotite (Fig. 6), due to its coexistence with garnet. Spinel inclusions in garnet have higher Cr #'s (27-33) than does M1 spinel (13-19), due to re-equilibration and reaction of spinel with garnet at higher pressures. The lowest Cr #'s in spinel (3-9) are found in M3 and M4 spinel in kelyphite, where spinel formed through the reaction, ol+grt=spl+opx+cpx.

It should be emphasized that garnet (the M2 mineral assemblage) only occurs at the margin of the Mohelno and Biskoupky peridotite bodies, within a few meters of the contact with surrounding felsic granulite. We suggest that the entire Mohelno and Biskoupky bodies were subjected to elevated pressures (~20–25 kbar) during subduction of oceanic lithosphere, but that the garnet-bearing M2 assemblage only developed along the margins of the bodies, where recrystallization was promoted by deformation.

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