Magnetic order and lattice anomalies in the J$_1$-J$_2$ model system VOMoO$_4$ ALESSANDRO BOMBARDI, Diamond Light Source, LAURENT CHAPON, ISIS-Rutherford Laboratory, IRENE MARGIOLAKI, ESRF, CLAUDIO MAZZOLI, ESRF, SABINE GHONTIER, CNRS, FABIENNE DUC, CNRS-Toulouse, PAOLO RADAELLI, ISIS-Rutherford Laboratory — High resolution x-ray and neutron powder diffraction measurements were performed on polycrystalline VOMoO$_4$. Below $\simeq 40$ K the system orders in a simple Néel antiferromagnetic state (propagation vector $\vec{k} = 0$), indicating a dominant role of the nearest-neighbor interactions. The order is three dimensional but the reduced saturated magnetic moment $m$ of 0.41 (1) $\mu_B/V^{4+}$ at 2 K indicates strongly 2D character and enhanced quantum fluctuations. On cooling, there is no evidence of a reduction of the crystal symmetry. However, neutron diffraction indicates an anomalous evolution of the lattice parameters, which can be related to the onset of magnetic correlations.