After mixing in the Galactic plane, the young stars are barely discernible from old ones. We have identified several RasTyc stars for which the lithium content is higher than that of the members of the Pleiades cluster. Furthermore, four of them are even concentrated within a few degrees, inside the CO Cepheus void, and likely constitute a new young association. To discover further members, we used multivariate analysis methods for selecting optical and infrared counterparts of ROSAT All-Sky Survey/XMM-Newton X-ray sources that were cross-identified with late-type stars. Based on our spectroscopic observations of this dataset, we discovered new lithium-rich field stars that are mainly located in the sky area surrounding the Cepheus void. These sources have properties rather similar to those of the TW Hydrae association members, although they turn out to be slightly older and placed in the northern hemisphere. We also highlighted the presence of a population of Pleiades-like sources, mostly projected in front of the Galactic plane. All these young stars in the field are of great importance to give new insight into the process of stellar formation outside standard star-forming regions.

Early discoveries • An unusual group of four lithium-rich stars were discovered towards one of sky areas devoid of interstellar matter in the Cepheus Flare region (Klutsch 2008). Guillout et al. (2010) showed that they form an homogeneous group of weak-line T Tauri stars with the same origin.

Selection and analysis • Looking for new members, Klutsch et al. (2011) described the analysis methods that enable us to select an sample of 162 young star candidates. We also included the source list from Tachihara et al. (2005), in which several T Tauri stars were discovered. We acquired their intermediate-and/or high-resolution spectra between September 2009 and November 2010. We then derived their spectral type, stellar parameters and radial velocities. We also study the age, kinematics, and chromospheric activity of our targets.

Results • Up to now, we found 14 sources (dots) with the same age as our comoving young stars (asterisks) and 22 Pleiades-like sources (squares). They form two distinct stellar populations located in different areas:

• the youngest sources, whose lithium content is consistent with that of the members of the ε Chamaeleontis (6 Myr) and Tucana-Horologium (30 Myr) associations, are mostly projected in front of the CO Cepheus void.
• the Pleiades-like source are mainly towards the Galactic plane.

All the young stars newly discovered in the CO Cepheus void have the same properties (age, radial velocity, ...) as the four comoving T Tauri stars.

Further details of this work will be presented in a future publication.