The ICON dynamical core is a new development initiated by the Max Planck Institute for Meteorology (MPI-M) and the Deutscher Wetterdienst (DWD). This dynamical core will combine several properties, which are considered important for future progress in numerical weather forecasting at DWD or climate research at MPI-M.

In particular the ICON dynamical core will solve the fully compressible non-hydrostatic equations of motion for simulations at very high horizontal resolution. The discretization of the continuity and transport equation will be consistent and mass of air and its constituents must be conserved, which is a requirement for atmospheric chemistry.

The new dynamical core solves the system of equation in grid point space on the icosahedral grid, which allows (a) the quasi-isotropic horizontal resolution on the sphere and (b) the restriction to regional domains. The choice of triangular cells given by the Delaunay triangulation allows C-grid type discretization and straightforward local refinement in selected areas, in the global as well as regional framework.