Chapter 5

Summary and conclusions

- The new observations in the FIR by the Herschel Space Observatory for a sample of 87 radio loud galaxies from the 3C-catalog were investigated. Therefore reduction and photometry was performed for the data from the PACS and SPIRE instruments. Where no sources were detected decisive upper limits could be given.

- The sample was split at redshift 0.5 into two representative sub-samples. The low-redshift sample contains many LERGs, the median-redshift sample many FSQs and in general more powerful RGs/QSRs. Complete photometry from diverse catalogues was collected for all sources to cover the SEDs continuously from optical to radio wavelengths.

- The new SEDs were used to measure host, AGN and star forming luminosities by fitting appropriate templates with a Metropolis-Hastings algorithm, based on maximizing the Bayesian posterior probability. Also model-independent luminosities were derived at selected wavelengths, to encounter opacity effects and non-thermal contributions from synchrotron emission.

- The class of MIR-weak sources was investigated. A new flux-ratio dependent definition of MIR-weakness could be given, which avoids an absolute threshold. Compared to the previously known definition, now MIR-weak sources can clearly be separated also at larger luminosities. Possible explanations of the MIR weakness are either an extreme cool and thin dust torus or lane seen directly from the edge. The MIR-weak sources can also represent an intrinsically different class of gas- and dust-poor AGN. Such a class may have suffered from evolutionary depletion by an early strong merger history.

- The dust-to-radio-lobe luminosity ratios were calculated in the range of $30 - 100\,\mu m$. This results in confirmation of the unification hypothesis of HERGs and QSRs for the low-redshift sources. For the medium-redshift sample this could not be proven without doubt but good evidence was found that at least at $100\,\mu m$ the HERGs and QSRs can be unified.

- For the whole sample, stellar masses and star formation rates were presented. This allows for the first time to put the host galaxies of radio-loud AGN into context with
non-AGN and radio-quiet AGN at their epochs. The analysis shows that radio-loud AGN are associated with the most-massive galaxies. In the majority of these galaxies new stars are formed only on a small level. The SFR may even be smaller if the dust torus contributes more at longer wavelength than indicated by currently available models.