

# Star Formation in Nearby Early-Type Galaxies: Mapping in UV, Optical and CO

M. Bureau<sup>1</sup>, R. Bacon<sup>2</sup>, M. Cappellari<sup>3</sup>, F. Combes<sup>4</sup>, R. L. Davies<sup>1</sup>,  
P. T. de Zeeuw<sup>3</sup>, E. Emsellem<sup>2</sup>, J. Falcón-Barroso<sup>5</sup>, H. Jeong<sup>6</sup>,  
D. Krajnović<sup>1</sup>, H. Kuntschner<sup>7</sup>, R. M. McDermid<sup>3</sup>, R. F. Peletier<sup>8</sup>,  
M. Sarzi<sup>9</sup>, K. L. Shapiro<sup>10</sup>, G. van de Ven<sup>11</sup>, S. K. Yi<sup>6</sup>,  
and L. M. Young<sup>12</sup>

<sup>1</sup>Sub-Department of Astrophysics, University of Oxford, United Kingdom

<sup>2</sup>Centre de Recherche Astronomique de Lyon – Observatoire, France

<sup>3</sup>Sterrewacht Leiden, Universiteit Leiden, The Netherlands

<sup>4</sup>Observatoire de Paris, France

<sup>5</sup>European Space Research and Technology Centre, The Netherlands

<sup>6</sup>Department of Astronomy, Yonsei University, South Korea

<sup>7</sup>ST-ECF, European Southern Observatory, Germany

<sup>8</sup>Kapteyn Astronomical Institute, Universiteit Groningen, The Netherlands

<sup>9</sup>Centre for Astrophysics Research, University of Hertfordshire, United Kingdom

<sup>10</sup>Department of Astronomy, University of California Berkeley, U.S.A.

<sup>11</sup>Department of Astrophysical Sciences, Princeton University, U.S.A.

<sup>12</sup>Department of Physics, New Mexico Institute of Mining and Technology, U.S.A.

**Abstract.** The SAURON integral-field survey reveals that small ( $\sim 0.1 R_e$ ) kinematically decoupled cores (KDCs) in early-type galaxies are increasingly young toward the center and are typically found in fast-rotating galaxies, while large KDCs ( $\sim 0.5 R_e$ ) have homogeneously old stars and are present in non-rotating galaxies (McDermid *et al.* 2006). GALEX UV imaging further allows the direct identification of regions of recent star formation ( $\leq 0.5$  Gyr). In NGC 2974 for example, young stars are identified in the center and an outer ring (Jeong *et al.* 2006). Nuclear and inner ionised-gas rings (Sarzi *et al.* 2006) then suggest that current star formation is bar-driven. The CO detection rate of SAURON early-type galaxies is  $\approx 40\%$  (Combes *et al.* in prep.). Synthesis imaging reveals that it is generally contained in a well-ordered central disk, both in galaxies with a (young) central stellar disk (e.g. NGC 4459, NGC 4526) or a (young) KDC (e.g. NGC 3032, NGC 4150) (Young *et al.* in prep.). CO also traces well the young stellar populations and ionised gas distribution and kinematics, but in KDCs not always the stellar kinematics (see Emsellem *et al.* 2004; Sarzi *et al.* 2006; Kuntschner *et al.* 2006).

**Keywords.** galaxies: elliptical and lenticular, cD, galaxies: formation, galaxies: evolution, galaxies: kinematics and dynamics, galaxies: stellar content, galaxies: individual (NGC 2974, NGC 3032, NGC 4150, NGC 4459, NGC 4526)

---

## References

- Emsellem, E., *et al.* 2004, *MNRAS* 352, 721.  
Jeong, H., Bureau, M., Yi, S.K., Krajnović, D., & Davies, R.L. 2006, *MNRAS* submitted.  
Kuntschner, H., *et al.* 2006, *MNRAS* 369, 497.  
McDermid, R.M., *et al.* 2006, *MNRAS* submitted.  
Sarzi, M., *et al.* 2006, *MNRAS* 366, 1151.