



IC342

My classification: Sb – moderately sized central bulge, moderately sized, well-defined spiral arms. Difficulty: small high-contrast core tempts me to classify this as Sc.

NOAO Classification: -, Other sources: SAB(rs)cd (NASA/IPAC Extragalactic Database)

De Vaucouleurs class Scd corresponds to approximate Hubble class Sc.  
([http://en.wikipedia.org/wiki/Galaxy\\_morphological\\_classification](http://en.wikipedia.org/wiki/Galaxy_morphological_classification))



M31

My classification: Sa – smooth and broad spiral arms and fat central bulge.  
NOAO Classification: -, Other sources: SA(s)b

De Vaucouleurs class Sb corresponds to approximate Hubble class Sb.  
([http://en.wikipedia.org/wiki/Galaxy\\_morphological\\_classification](http://en.wikipedia.org/wiki/Galaxy_morphological_classification))



M66

My classification: SBc – loosely wound spiral arms, very small bulge (blue star-forming regions are rather close to the galactic center.) I think this galaxy is tilted to the observer at about  $45^\circ$  in the horizontal plane of this photograph.

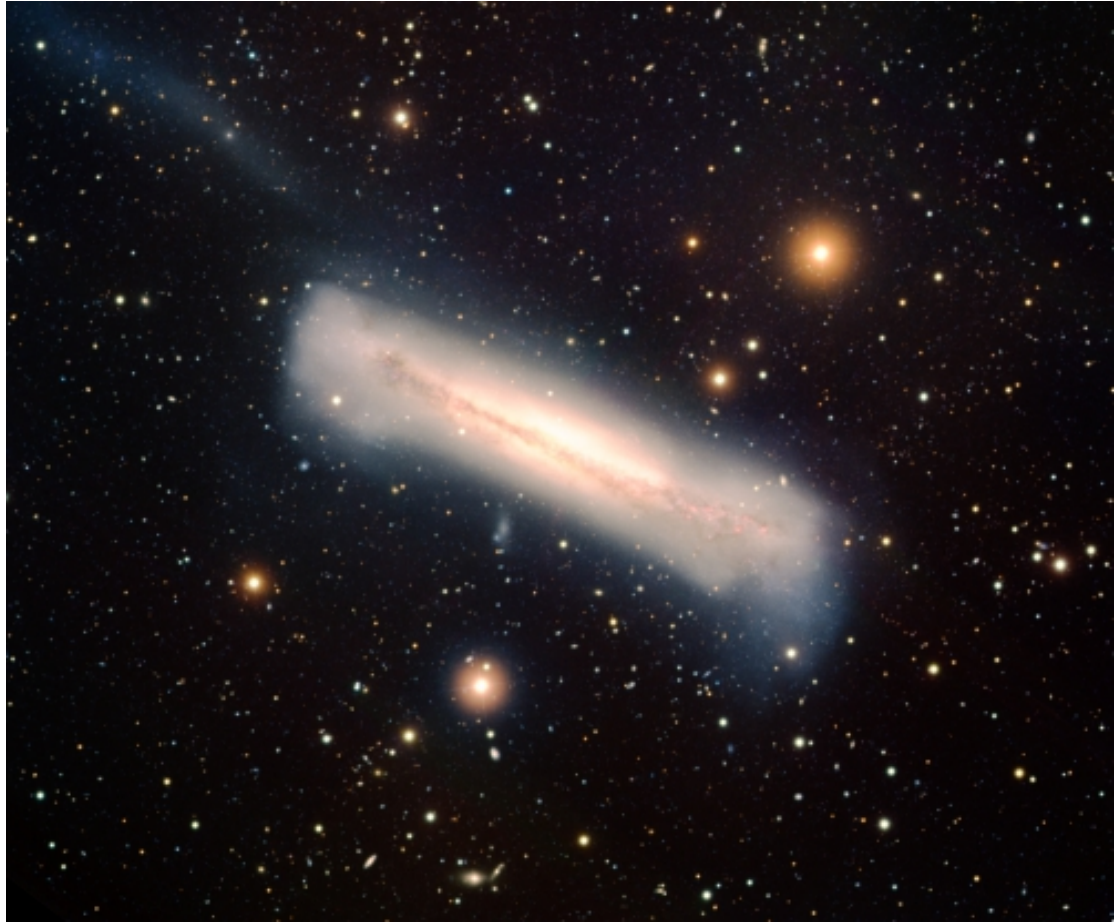
NOAO Classification: Sb



NGC 2442

My classification: Irregular because of asymmetry. There are hints of spiral structure, however (Sc?).

NOAO Classification: SBbc.



NGC 3628

My classification: Spiral, seen edge-on. Disk of dust is seen as well as H II regions which are usually prominent in spiral galaxies. Since we don't see the texture of spiral arms it is impossible to provide further classification.

NOAO Classification: -, Other sources: SAb pec (NASA/IPAC Extragalactic Database)

De Vaucouleurs class Sb corresponds to approximate Hubble class Sb.  
([http://en.wikipedia.org/wiki/Galaxy\\_morphological\\_classification](http://en.wikipedia.org/wiki/Galaxy_morphological_classification))

HIT!



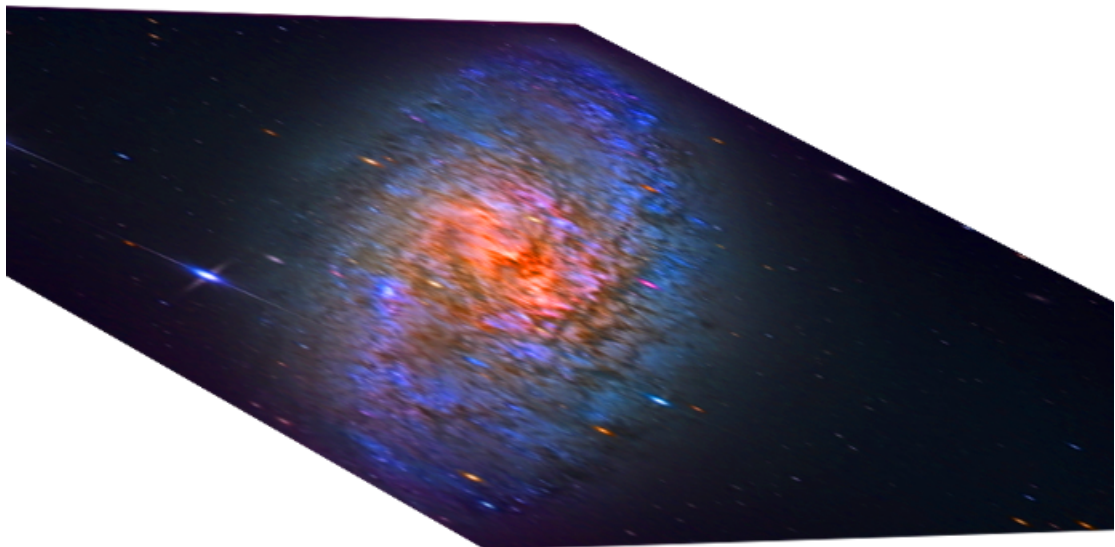
### NGC 253

My classification: SBa, seen tilted at high angle to the observer. Lots of dust, however it looks like the spiral arms are broad and smooth and are tightly.

NOAO Classification: -, Other sources: SAB(s)c (NASA/IPAC Extragalactic Database).

De Vaucouleurs class Sc corresponds to approximate Hubble class Sc. ([http://en.wikipedia.org/wiki/Galaxy\\_morphological\\_classification](http://en.wikipedia.org/wiki/Galaxy_morphological_classification))

In this photograph, I think that a bar can be seen made of population II stars. I have made a quick transformation of this photograph to make the galaxy circular with exaggerated colors:



Actually, a recent paper addresses NGC 253 as a barred galaxy of type SBc (Iodice et al. 2014). It was difficult for me to understand the structure of the spiral arms due to high inclination.

References:

Iodice, E., Arnaboldi, M., Rejkuba, M., et al. 2014, A&A, 587, 16



M84

My classification: E4. Difficult to assess ellipticity without measuring. I guess we need to define the elliptical fit for this galaxy and then measure the ratio of its axes.

NOAO Classification: E1

I agree I probably exaggerated eccentricity.





M49

My classification: E2. Similar to M84, it is difficult to classify ellipticity.

NOAO Classification: E4

This galaxy appears rather circular to me visually. It is interesting to see NASA/IPAC Extragalactic Database classify it as E2 which is consistent with my assessment.

HIT!



M98

My classification: Sb, seen tilted at high angle. It is tempting to classify it Sc, however, due to loosely wound arms, however the bulge, I think, is too large for an Sc.

NOAO Classification: Sb.

HIT!



NGC 4656 Hockey Stick

My classification: Irregular.

NOAO Classification: -, Other sources: Sc pec  
(<http://messier.seds.org/xtra/ngc/n4656.html>)

Some papers (Mayya 1995) classify it as irregular.

References:

Mayya, Y. D. 1995, Bulletin of the Astronomical Society of India, Vol. 23, No. 4