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THE STAR FORMATION HISTORIES OF DISK GALAXIES: THE LIVE, THE DEAD, AND THE UNDEAD

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ABSTRACT

We reexamine the systematic properties of local galaxy populations, using published surveys of star formation, structure and gas content. After recalibrating star formation measures, we are able to reliably measure specific star formation rates well below that of the so-called “main sequence” of star formation vs mass. We find an unexpectedly large population of galaxies with star formation rates intermediate between vigorously star-forming main sequence galaxies and passive galaxies, and with gas content disproportionately high for their star formation rates. Several lines of evidence suggest

Более полная «главная последовательность»

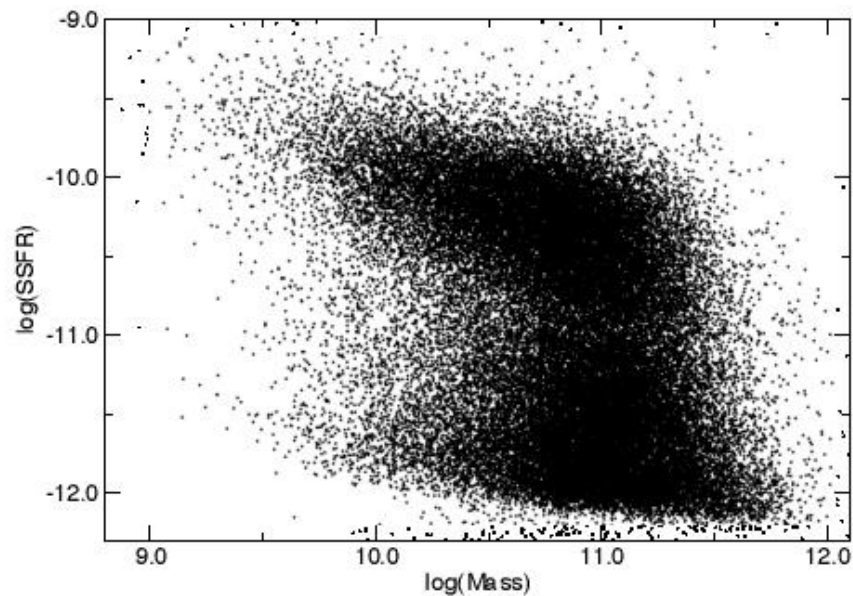


FIG. 4.— SSFR versus mass for the maximally complete sample. obscured at high masses by a broad swath of lower SFR objects. In all following analyses, the sample will be limited to the maximally complete sample unless explicitly stated otherwise.

Бимодальный срез на фиксированной массе!

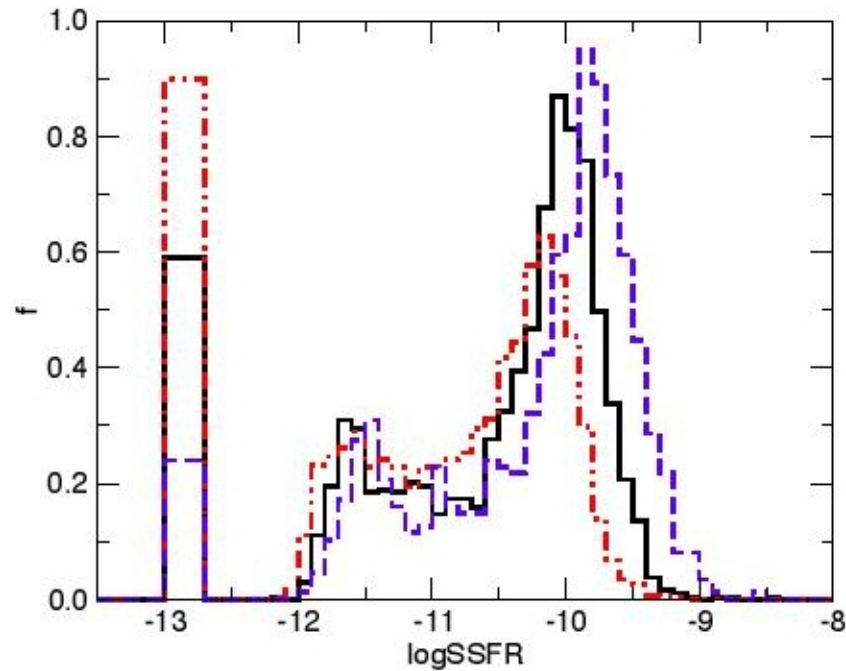


FIG. 5.— Distribution of $\log(\text{SSFR})$ for galaxies in the maximally complete sample, in three narrow intervals of $\log(\text{Mass})$, centered at 9.5 (blue), 10.0 (black), and 10.5 (red).

НОВЫЙ ТИП ЗВЕЗДООБРАЗОВАНИЯ В ДИСКАХ!



FIG. 7.— SDSS images of a representative sample of brighter galaxies with $\log(SSFR) \sim -11.5$. Each image is $48''$ across.

Другая связь с количеством газа

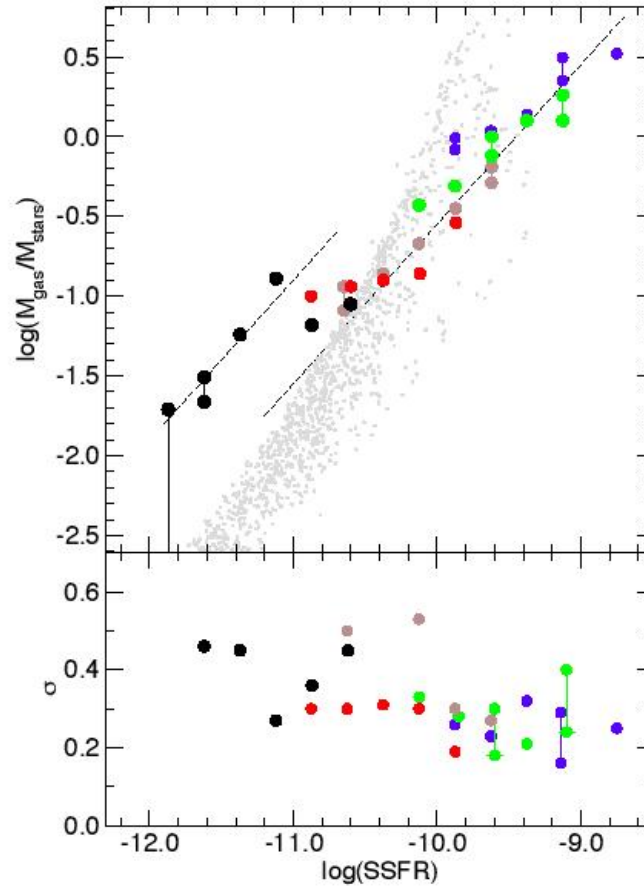


FIG. 10.— HI gas content per unit mass versus SSFR. a- median gas content, b- 1σ dispersion about the median. black circles- ASS+ALFALFA sample, colored circles- ALFALFA sample in 4 ranges of $\log(\text{Mass})$: blue- 9.0–9.5, green- 9.5–10.0, brown- 10.0–10.5, red- 10.5–11.0. upper dashed line- $\tau_{\text{gas}} = 21 \times 10^9$ years, lower dashed line- $\tau_{\text{gas}} = 4.7 \times 10^9$ years. grey points- log-normal model.

Некие идеи по поводу происхождения...

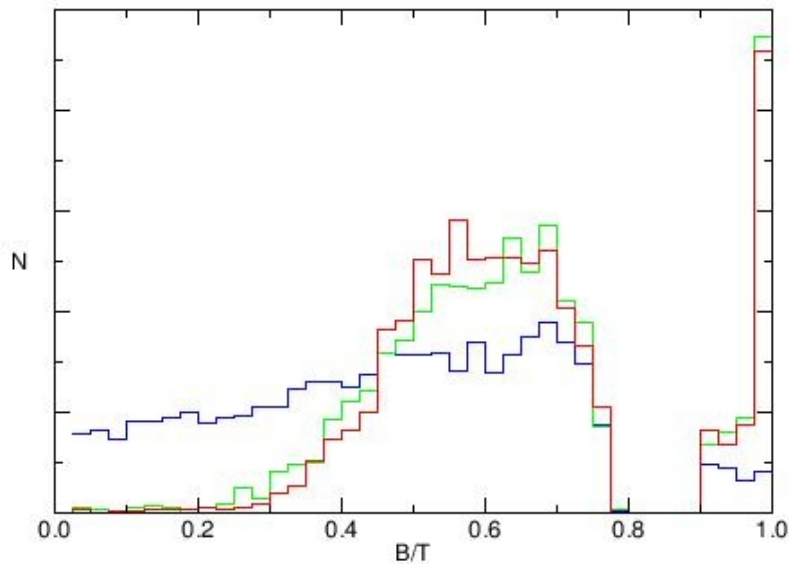


FIG. 11.— Distribution of bulge mass fraction for star-forming-blue, quiescent- green, and passive-red galaxies, in the mass range $10.0 \leq \log(Mass) < 11.0$.

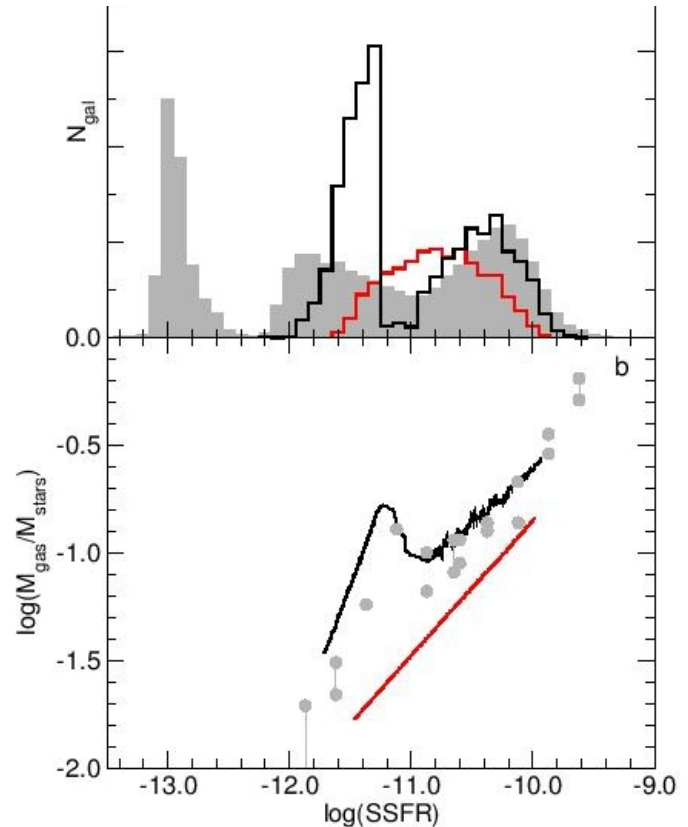


FIG. 13.— Comparison of properties of galaxies in the mass range $10.0 \leq \log(Mass) < 11.0$ with the predictions of a simple model of galaxy evolution. a- distribution of SSFR; grey area- observations, red curve model evolution without disk stability cutoff in SSFR, black curve- model evolution with disk stability cutoff. b- median gas-to-stellar mass ratio vs SSFR. grey points- observations, red points- model without disk stability cutoff, black points- model

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NGC 5523: An Isolated Product of Soft Galaxy Mergers? (*Research Note*)

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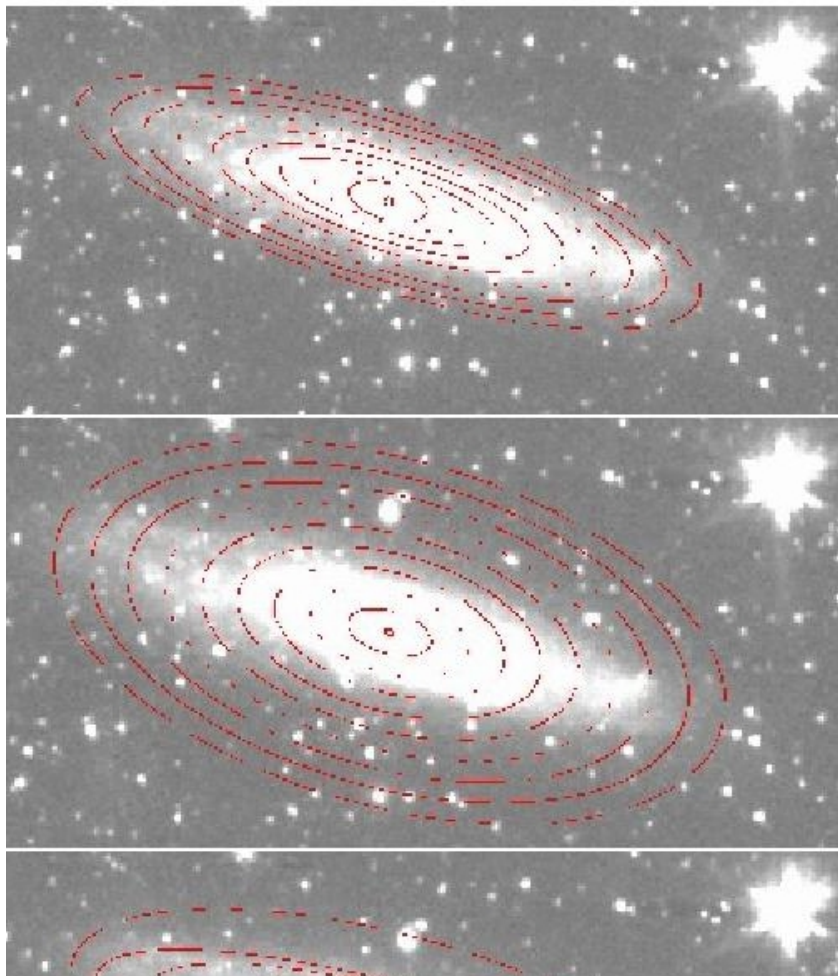
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November 21, 2016

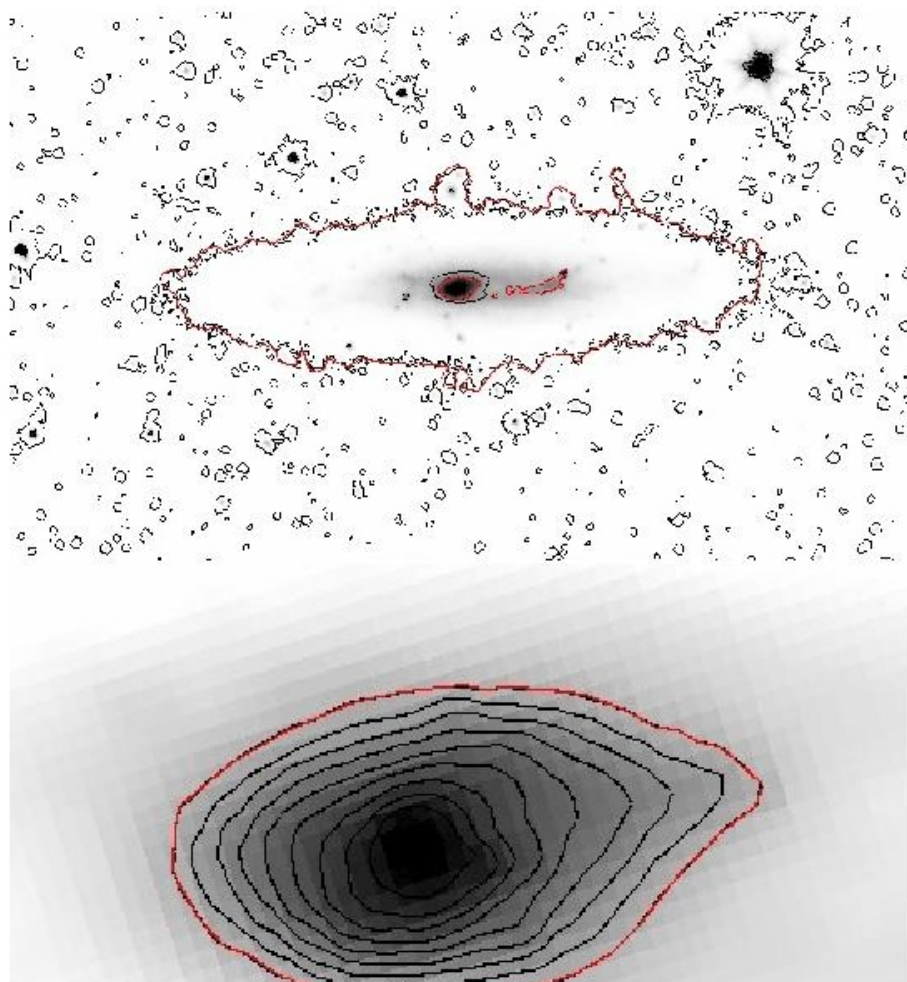
ABSTRACT

Multi-band images of the very isolated spiral galaxy NGC 5523 show a number of unusual features consistent with NGC 5523 having experienced a significant merger: (1) Near-infrared (NIR) images from the Spitzer Space Telescope (SST) and the WIYN 3.5-m telescope reveal a nucleated bulge-like structure embedded in a spiral disk. (2) The bulge is offset by ~ 1.8 kpc from a brightness minimum at the center of the optically bright inner disk. (3) A tidal stream, possibly associated with an ongoing satellite interaction, extends from the nucleated bulge along the disk. We interpret these properties as the results of one or more non-disruptive mergers between NGC 5523 and companion galaxies or satellites, raising the possibility that some galaxies become isolated because they have merged with former companions.⁰

Асимметрия ...



Поток от размазанного мержера?



Профили яркости и цвета – кольца?

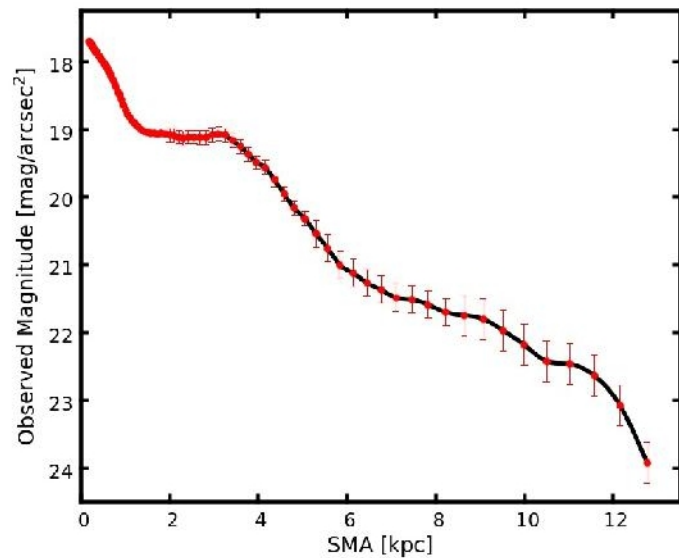


Fig. 3: Observed $3.6\mu\text{m}$ Magnitude vs. Semi-Major Axis (SMA) for the inner and outer disks of NGC 5523, from the Ellipse

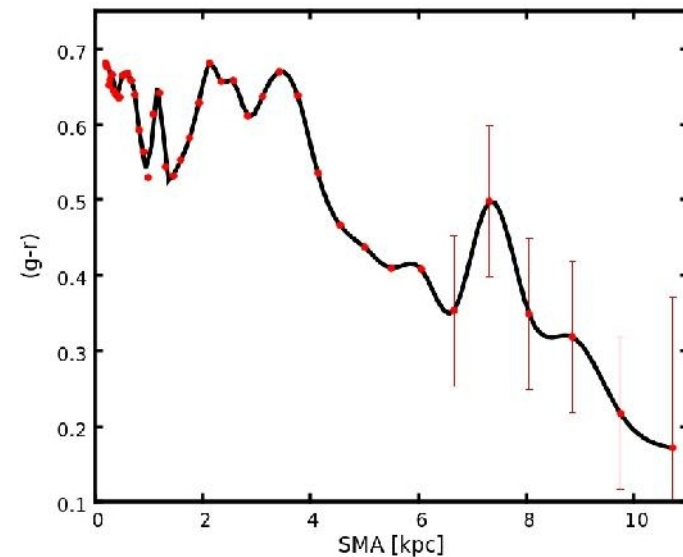


Fig. 4: Color analysis of NGC 5523 from SDSS (g-r) images.

VIPERS, 1st Release!

- Статьи 1611.07045, 1611.07046,
1611.07047, 1611.07048, 1611.07049