THE GROWTH OF MASSIVE GALAXIES SINCE Z = 2

List of uncertain terms/concepts:

1. Constant number density
2. Galaxies at different epochs
3. Deep stacked rest-frame R-band images of galaxies - In my opinion, this means that multiple images in the near-infrared filter (basically rest-frame optical images) are stacked on top of each other to increase the exposure time. A longer exposure time means the images taken are more detailed and can help reduce the uncertainties in the data.
4. From what I understand till this part of the abstract, they are selecting the massive galaxies which might have similar “constant density number”, but would be at different redshifts. These selected galaxies will be in the sample.
5. Characterizing the stellar distribution to surface brightness limits of approximately 28.5 mag $arcsec^{-2}$ - I am not sure how they got the 28.5, and why they are using this particular number.
6. I am still having problems understanding the effective radius and sersic number and how that can be related to the redshift.
7. Massive galaxies have grown mostly inside-out.
8. Massive galaxies do not evolve in a self-similar way - What does self-similar way mean? Does it mean that the evolution of all the massive galaxies was assumed to be similar?
9. Structural profile of galaxies - I think what this means is how the stars, gas clouds, and dust is distributed in the galaxy, where most of the galaxy’s stellar mass is concentrated, where most of the light from the galaxy is coming from.
10. Conversion from light-weighted to mass-weighted radial profiles - I think light-weighted means the radius measurement of a galaxy based on where the galaxy is the brightest, maybe mostly dominated by younger, bluer stars. Mass-weighted means where most of the stellar mass is concentrated or located, which might point to older, dimmer stars, maybe a lot of G, K, M main sequence stars. I am not sure if we can include dark matter in the measurement of mass-weighted radial profiles.
11. Intrinsic scatter in the fundamental place region.
12. What are the dramatic changes referred to in the introduction that are implied by the measurements at z approximately 2? Is this referring to massive galaxies at z = 2 being more compact than the ones at z = 0?
13. Selection effects.
14. Photometric redshifts - Does this mean measuring the galaxy’s brightness at different wavelengths (using different wavelength bands) rather than using a detailed spectrum? From what I know, dust in the galaxy can make it appear at a different redshift than it actually is because dust is mostly observed at infrared wavelengths.
15. Self-consistent procedures as a function of redshift to estimate the size of a galaxy - Does this mean using the same pipeline of data analysis for all the galaxies you are observing to keep the observations and analysis consistent across all galaxies?

16. Redshift bandpasses - Do they basically mean B, R, Z, I, etc. bandpasses or do they mean something else?
17. Color gradients in redshift-dependent corrections.
18. Stellar kinematics - Is this just how different stars evolve over time and what amount of brightness do they contribute over their lifespan?
19. What is the conversion of light-weighted to mass-weighted radii?
20. What could be an example or a simpler explanation of self-consistent procedures for galaxy size measurements?
21. Why do they stack the images for these galaxies to get the surface brightness profile? Is it because they want to get a much more accurate measurement of the galaxy's surface brightness, and stacking images increases their exposure time?
22. What does it mean when they say "outer envelopes of massive galaxies were already in place at early times"?

The broad research question the article is contributing to:

How do massive galaxies evolve, especially from z = 2 to z = 0?

Other impressions based on the abstract and introduction, especially if there is anything you intend to focus on specifically as you read more of the article:

This is a very interesting paper which focuses on understanding the massive galaxies we are observing at z = 0, and comparing them to the massive galaxies observed at z = 2. The paper suggests that the galaxies at z = 2 appear to be more compact. It talks about the factors that influence this growth, possibly because of mergers with other smaller galaxies, merger-induced starburst in the galaxy, or other unknown factors. It also highlights how the effective radius and the sersic index/number changes as a function of redshift for these massive galaxies. From what I interpreted from the abstract and the introduction is that the paper is trying to answer a narrower question of the possibility of simultaneously explaining the properties of galaxies at z = 2 and z = 0 using a single model, and whether small sizes of high-redshift galaxies are because of the errors in measurement, or could there be more parameters associated with it.

I would honestly like to focus more on the methodology of how they first isolated the galaxies they wanted to observe for their analysis and what were the calculations they performed to get these results.