

WEBVTT

1

00:00:00.000 --> 00:00:01.050

Angela Adamo: lazzara.

2

00:00:03.449 --> 00:00:15.179

Angela Adamo: and Morgan for the invitation and to all of you for coming today to listen to to my presentation so as Sarah said, I will talk about the stack cluster.

3

00:00:15.719 --> 00:00:30.810

Angela Adamo: And I will focus on starcraft information and feedback for this colloquium, although I have to say my abstract was a bit ambitious, I will not talk a lot about hydration simply for time reasons.

4

00:00:32.070 --> 00:00:32.760

Angela Adamo: So.

5

00:00:34.140 --> 00:00:42.270

Angela Adamo: Yes, I would like also to thank my my student Lorenzo de la Luna she's actually going to finish.

6

00:00:43.410 --> 00:01:00.780

Angela Adamo: Some meeting it says the 10th of December and defending in January and part of the result i'm going to present our hair work here to the work and then also, I would like to thank the High peak in the legal steam, and in a few slides you this would come more clear.

7

00:01:01.980 --> 00:01:02.610

Angela Adamo: So.

8

00:01:03.330 --> 00:01:06.240

Angela Adamo: Okay, so if we see.

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00:01:06.480 --> 00:01:18.450

Angela Adamo: Now, if you see how beautiful view of our own own the Milky Way as we could see if we are in a dark place on earth.

10

00:01:19.080 --> 00:01:38.820

Angela Adamo: And, but essentially by looking at our own Milky Way and explore the breadth of wavelength range, we are able to observe nowadays, we are actually capable of observing how cluster form So you see here on the top left, this is a beautiful.

11

00:01:40.680 --> 00:01:56.010

Angela Adamo: Car map so then called the dense gas region is a signal says X and in this region actually a star cluster is forming so it's one of the most massive star from the region in our own galaxy.

12

00:01:56.580 --> 00:02:10.470

Angela Adamo: And if we would have a clock and with a few million years but actually it's cooler we don't need to do that, we can see just after a few million year legions like signal sex evolve into what we see here.

13

00:02:11.250 --> 00:02:22.020

Angela Adamo: In that image of Western on the tube, this is a class at roughly six kilo per set away from us, and this is a beautiful images from the hubble space telescope.

14

00:02:22.380 --> 00:02:42.450

Angela Adamo: Do you see my cursor actually I forgot to ask when I move yes great thanks so here thanks to the hubble we can actually resolve star cluster in our Milky Way in their stellar component and we can see that there is still a lot of the.

15

00:02:43.470 --> 00:02:50.040

Angela Adamo: nonsense, not a giant black clouds where the stars of form, is still hanging around the cluster.

16

00:02:50.640 --> 00:03:02.550

Angela Adamo: And then, if again we wait roughly hundred million years regions are like Western two foot look like the player this right, so they will look like this open cluster.

17

00:03:02.910 --> 00:03:25.830

Angela Adamo: Moving in our Milky Way disk and the Finally, if we will wait long enough actually we wait here like a hard time we can find the star cluster as globular clusters, so we are looking at the different the realizations of the same process that which is the formation of stars.

18

00:03:26.130 --> 00:03:28.020

Angela Adamo: In our cluster at the fashion.

19

00:03:28.380 --> 00:03:37.110

Angela Adamo: and on top of that star class that are gravitationally bound, therefore, they will survive for a long time in our Milky Way this.

20

00:03:38.130 --> 00:03:50.070

Angela Adamo: Actually, in this, and here we have been able to detect start class or even at high ratio that we have done so, thanks to the help of gravitational lensing here I show you.

21

00:03:51.030 --> 00:04:00.990

Angela Adamo: A beautiful image of the summers the arc is this beautiful harking, which is actually roughly 10 images of the same galaxies.

22

00:04:01.500 --> 00:04:08.490

Angela Adamo: And if we zoom in into the galaxy we see this a bright spots here, these are all star cluster.

23

00:04:09.120 --> 00:04:30.780

Angela Adamo: And we look at the first of the light of this, regions, this is a galaxy nowadays it's 2.4 and we see stellar feature and emission the assumption, which are typical of very young star cluster, so we are really looking to start cluster formation, but at the peak of the cosmic.

24

00:04:32.280 --> 00:04:48.270

Angela Adamo: Easter Easter formation history of our universe, so in this talk, we will look, we will focus on local galaxies and in the local universe, and here I have for you are beautiful image of MIT three you see.

25

00:04:49.110 --> 00:04:59.250

Angela Adamo: When we look at galaxy which are outside so when we look beyond our Milky Way and other galaxies we have an advantage that we can explore.

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00:05:00.180 --> 00:05:04.350

Angela Adamo: The cluster population in all its phases.

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00:05:04.800 --> 00:05:15.690

Angela Adamo: So we can look at cluster that are forming we can look at cluster for the feedback is interacting with the surrounding to molecular cloud so is creating edge two regions.

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00:05:15.960 --> 00:05:24.690

Angela Adamo: And then we can look at cluster evolving so staying because they're gravitationally bound, they will move in the disk as entities.

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00:05:25.290 --> 00:05:34.560

Angela Adamo: So, actually, this is also the outline of my talk, so we will look in the first part that young star population in local galaxies because there are.

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00:05:34.980 --> 00:05:42.090

Angela Adamo: A lot of ongoing surveys so actually we have been looking at the larger number of cluster populations.

31

00:05:42.630 --> 00:06:00.210

Angela Adamo: We would look at then in the second part will focus on the stellar feedback from these regions and in the third part I would present my the accepted to the publicity proposal for cycle, one where we will look at the emerging phases of young star cluster.

32

00:06:01.410 --> 00:06:19.470

Angela Adamo: So classic population local galaxies essentially we are gonna look at the how this population keeps imprints of the properties of their host galaxies and we will do that using the Lego sample So this was.

33

00:06:20.490 --> 00:06:22.830

Angela Adamo: horrible treasury program which.

34

00:06:23.910 --> 00:06:37.260

Angela Adamo: for which the data were taken between 2015 and 2016 and since then we have published and analyze these galaxies and we have looked at them with the hate to stay.

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00:06:37.950 --> 00:06:46.980

Angela Adamo: With the hubble space telescope and we have taken images in the UV throughout the defender up to the near infrared.

36

00:06:47.700 --> 00:06:57.150

Angela Adamo: And here, you see it's roughly 50 galaxies we spend our larger range of stuff from Michelle rate the galaxy morphology galaxy.

37

00:06:57.570 --> 00:07:11.640

Angela Adamo: stellar mass and so on, and on top of the of this of the Lego survey I I had recently the high pick one which asked focus the study in emerging galaxies.

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00:07:11.940 --> 00:07:19.620

Angela Adamo: And the here, you see the six galaxy which are part of the high big sample and to give you and.

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00:07:20.040 --> 00:07:29.640

Angela Adamo: Let you understand, so this is subplot where I put stuff Commission rate in local galaxies versus the distances So you see the legless galaxies are within.

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00:07:30.120 --> 00:07:44.730

Angela Adamo: A few tenths of a percent and they therefore represent the galaxy which are in there in this volume, while when we look at the high big we are extending the rain, so we we are the larger distances.

41

00:07:45.090 --> 00:07:56.100

Angela Adamo: But we are actually extended debate the range of star formation right, so we are looking a cluster formation in galaxies are which are more similar.

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00:07:56.460 --> 00:08:07.800

Angela Adamo: To main sequence galaxy at higher they shift here, you see where the high people will stand in the main sequence and from redshift the duck we wanted to.

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00:08:09.030 --> 00:08:19.770

Angela Adamo: So Okay, with this in mind, I will first introduce you to the concept of cluster formation, efficiency and it's not really.

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00:08:21.180 --> 00:08:38.640

Angela Adamo: An efficiency per se, but essentially you can think of cluster formation efficiency, which we call here gamma as the destruction of stars that are forming inbound cluster with respect to the total number of stars, which are forming in the galaxy.

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00:08:40.020 --> 00:08:53.610

Angela Adamo: And Essentially, what do we have understood he listened here, so you see how we estimate the classification efficiency is the the stellar massing cluster divided by the star formation rating the galaxy.

46

00:08:54.180 --> 00:09:06.690

Angela Adamo: And what we think drives This efficiency it's the star formation efficiency actually the gas surface density of galaxies and the stability.

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00:09:07.590 --> 00:09:27.420

Angela Adamo: The potential of the galaxy and the stability of the gas within it, so if we look at the recent here, this is the trend, so this in 2016 it's all the galaxy for which gamma has been studied and we see essentially that.

48

00:09:28.710 --> 00:09:50.250

Angela Adamo: Not by fitting by simply looking at how galaxy locate here is it looks like the galaxy whichever last information identities, which is also a proxy for gas surface density, as ever, usually are typically lower classification efficiency that galaxies which are highly efficient here.

49

00:09:51.360 --> 00:10:00.810

Angela Adamo: So you see, also on the plot the fiduciary order, so this is not fitting the data by simply trying to reproduce the trend that we're observing the data.

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00:10:01.140 --> 00:10:16.230

Angela Adamo: proposed by crowds in 2012 in this model, there is a dependency from the surface density stability of the disk and so as represented by the tumor parameter.

51

00:10:17.550 --> 00:10:25.290

Angela Adamo: So then, you see different the lines so and what is the different line essentially simply the conversion of this.

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00:10:27.270 --> 00:10:35.370

Angela Adamo: model proposed by clouds and he actually has got surface density so then to plot to the mother, here we need to convert this.

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00:10:35.640 --> 00:10:49.470

Angela Adamo: Gas surface density into star formation re densities there for the sorry the line is this conversion using the chemical mutilation, while the dotted line is that the conversion using the mcgill formulation.

54

00:10:50.790 --> 00:11:05.400

Angela Adamo: So, of course, then since 2016 the legacy galaxy have come in more study ever been done with the hubble space telescope and here you see a compilation of data from.

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00:11:06.990 --> 00:11:24.270

Angela Adamo: 2020 is updated up to 2020 we are uploading all the data in the literature, which means that different works here have used the different methodologies, but the message that we wanted to convey is that.

56

00:11:25.410 --> 00:11:29.490

Angela Adamo: inspiring spite of the largest factor which tells us, we are really not.

57

00:11:30.720 --> 00:11:44.940

Angela Adamo: capturing well the full extent of this information, efficiency and we see that there is a trend and the trends that are men here, you see the high peak galaxies, these are all the legacy galaxies.

58

00:11:45.330 --> 00:11:55.260

Angela Adamo: So, and actually recently this year, even the some bars are the one I showed in a few slides before us have been.

59

00:11:56.040 --> 00:12:20.850

Angela Adamo: posted on this diagram and there we see a timesheet sorry she took point four, this galaxies forming stars, with the condition that we can imagine, so that we understand that is going on in the star formation process of this galaxy so Actually, this was a beautiful results recently published.

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00:12:22.140 --> 00:12:26.400

Angela Adamo: Of course, there has been not source simulation where.

61

00:12:27.450 --> 00:12:41.790

Angela Adamo: we're so we try to simulate cluster population evolving, together with the data within their host galaxies and in the in the right polo to So you see the medium values and the Gray.

62

00:12:42.720 --> 00:12:52.950

Angela Adamo: symbols are they'll serve data, while the the band's called bands are a simulation of galaxies in redshift.

63

00:12:53.820 --> 00:13:07.830

Angela Adamo: Assuming different recipes for star formation, efficiency and you see that, first of all different star formation efficiencies result in different cluster formation, efficiency and.

64

00:13:08.670 --> 00:13:23.430

Angela Adamo: Secondly, that is very difficult to simulate star cluster in galaxies because essentially they really depends on the way we assume stuff from it, which is the star formation efficiency.

65

00:13:24.540 --> 00:13:32.460

Angela Adamo: But, overall, the trend is there, also in the simulation so we think that the what we see in observations is.

66

00:13:33.750 --> 00:13:47.910

Angela Adamo: is something physical happening, and on the right side i'm comparing with the email sykes simulation in this case, these are cosmological simulation equals simulation and read a zoom in.

67

00:13:48.480 --> 00:14:05.910

Angela Adamo: and actually clusters are at our pencil been in the simulation and our lead to evolve, following the condition of the gas in the galaxies and they're still on my system properties and again, you see that the correspondence with observation is quite good.

68

00:14:07.770 --> 00:14:18.120

Angela Adamo: So Okay, now we move on into another property about the cluster population, which I think is interesting for the for the second part of this talk.

69

00:14:18.480 --> 00:14:34.980

Angela Adamo: And these are there must function and essentially you see here that usually We assume that the mass function is that simple power law but actually when we compare that the power law we don't serve the mass distribution here, you see the Community and mass distribution for.

70

00:14:36.420 --> 00:14:48.330

Angela Adamo: And we assume that we do simulation so we do Monte Carlo of our population with this pure power loss shape that the we recover less massive cluster.

71

00:14:48.810 --> 00:14:57.870

Angela Adamo: In i'm 51 and actually to reproduce this absurd trend that we need to assume a schecter truncation here, this is about.

72

00:14:58.560 --> 00:15:16.950

Angela Adamo: exponential truncation how that characteristic mass and you can think of this characteristic mass as the probability of forming cluster more massive than this massive becoming a faster very unlikely so going down very fast.

73

00:15:17.790 --> 00:15:35.100

Angela Adamo: So in again in 2017 with the four point, it was suggested that the truncation mass in local galaxies follow the star formation identity, which again is a proxy of gas surface density in discs of galaxies.

74

00:15:35.640 --> 00:15:49.440

Angela Adamo: And they must like simulation which I introduced before actually find a similar trend, but they see also spread which adult are commanded us being caused by angular velocity so.

75

00:15:51.960 --> 00:16:05.610

Angela Adamo: Of the stability of the gas in the disk in in simple words so then in recent analysis, we have added actually the high peak and the laggards galaxies.

76

00:16:06.060 --> 00:16:12.780

Angela Adamo: And we have done so, so you, you see, on the relation that I brought up before, which is the solid line.

77

00:16:13.200 --> 00:16:24.870

Angela Adamo: I add the now new data and the for the high peak we see that the galaxy which are in their funnel merging face are actually forming more massive cluster.

78

00:16:25.140 --> 00:16:32.700

Angela Adamo: than predicted by this relation, while the galaxy which are in their early matter so where we see study the two components.

79

00:16:33.270 --> 00:16:49.230

Angela Adamo: are following this relation more closely so they're they're that cluster masses lower maximum cluster mass and the full spiral galaxy here when we look at single very difficult to have a statistical.

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00:16:50.580 --> 00:16:53.250

Angela Adamo: constraint on the on the truncation mass.

81

00:16:53.520 --> 00:17:05.220

Angela Adamo: But if it will combine all the Lego spirals into hollister forming a loss of forming with trace again this truncation master so even combining galaxies we still don't see.

82

00:17:05.610 --> 00:17:16.530

Angela Adamo: The larger number of sorry but I go back here, we do not see dismissing number of cluster okay so and then finally.

83

00:17:17.250 --> 00:17:33.570

Angela Adamo: For the dwarfs we do not get a hint base also true that door for galaxies are a bit more special in there, so we in the legacy we have a wide range of stuff permission identity, but not many cluster to constraint that location.

84

00:17:35.100 --> 00:17:41.910

Angela Adamo: OK, so now i'm over in the last 10 minutes in the second part of the talk and.

85

00:17:42.690 --> 00:18:01.140

Angela Adamo: We look at the youngster cluster feedback and look at galaxy and essentially we will focus on on on star cluster nurseries and we try to evaluate the Fed of their feedback on the on the leftover glass of the giant molecular clouds.

86

00:18:01.740 --> 00:18:02.820

Angela Adamo: So I.

87

00:18:02.850 --> 00:18:07.020

Angela Adamo: Go back to this beautiful image of West along too, because I think it's quite.

88

00:18:08.400 --> 00:18:16.740

Angela Adamo: lucrative so we see here the young cluster and this distributed within a size of a few per second radius and this.

89

00:18:17.070 --> 00:18:27.630

Angela Adamo: The intense.to so the one, not the tiny one but they're very bright line, those are very massive stars, those are stars more massive than eight solar masses.

90

00:18:27.960 --> 00:18:35.760

Angela Adamo: And they are short lived so they would live a few million year, especially this and, because these are all stars of the time, indicating here.

91

00:18:36.150 --> 00:18:45.000

Angela Adamo: But this starts out of the key ones for producing actually stellar feedback, so we know that, during the first few million years.

92

00:18:45.330 --> 00:18:53.220

Angela Adamo: We have a strong UV radiation which produce pressure radiation pressure and produced photo you're Nice to the gas.

93

00:18:53.760 --> 00:19:04.560

Angela Adamo: We have also stellar wins in very massive stars and stellar wins in impressive give a transmitter transmitter momentum to the gas.

94

00:19:05.100 --> 00:19:18.570

Angela Adamo: So it's a they produce mechanical energy they produce shocks and they also produce metal so that in reaching their highest Sam so the industry, the the gas of their age, two regions.

95

00:19:19.080 --> 00:19:29.670

Angela Adamo: And finally, if we wait, as already after four or 5 million years supernova explosion takes over and they produce a lot of mechanical energy.

96

00:19:30.390 --> 00:19:36.150

Angela Adamo: That the will they will finally destroy destroy than the song that multiple clouds.

97

00:19:37.140 --> 00:19:45.420

Angela Adamo: So we will focus now are beaten, the early phases and we're in particular on the UV radiation feedback from this regions.

98

00:19:45.780 --> 00:20:02.220

Angela Adamo: And the recently in the literature, we see a lot of analysis which focus on pressure terms, so, and in particular it's a smaller piece supernova feedback because it's the pressure terms that developed by.

99

00:20:03.330 --> 00:20:12.600

Angela Adamo: The financing radiation produced by the stars, so we will, in the next few slides because our presenters someday so sometimes it's called.

100

00:20:12.930 --> 00:20:33.810

Angela Adamo: A learning session pressure, sometimes called edge to region pressure or 10 mile pressure, but essentially what it is, is the pressure accepted by the warm United States so it's the kinetic pressure of the gas and then the direct pressure is essentially our volume average.

101

00:20:36.180 --> 00:20:42.990

Angela Adamo: direct pressure radiation pressure so it's essentially how the momentum of the photons.

102

00:20:44.070 --> 00:20:50.070

Angela Adamo: is changing within the two regions and that change the momentum exert pressure.

103

00:20:50.700 --> 00:21:01.020

Angela Adamo: And I think what is important for you to remember is that the only session pressure depends on the density of the United States and the temperature.

104

00:21:01.440 --> 00:21:13.200

Angela Adamo: While the direct pressure is depending on the you will be there, I from HR for luminosity with a conversion into the moral metric luminosity and the radius of nature to region.

105

00:21:14.100 --> 00:21:28.380

Angela Adamo: So for we're looking at ngc 300 this is galaxies traffic to my dad passed away So you see here the galaxy is actually covered the continuum of the galaxy and we show the the day mission.

106

00:21:29.700 --> 00:21:41.760

Angela Adamo: Three color image of the mission of the United States, so every bride to region filament the region here is sexual and he stood engine in this galaxy, and these are amused data.

107

00:21:42.810 --> 00:21:43.140

Angela Adamo: That.

108

00:21:44.160 --> 00:21:57.750

Angela Adamo: We have us stop serving this galaxy and actually what do we see when we evaluate the organization pressure, so the pressure exerted the kinetic pressure and.

109

00:21:58.560 --> 00:22:03.750

Angela Adamo: and direct pressure, so the momentum accepted by the photons we see that.

110

00:22:04.350 --> 00:22:19.410

Angela Adamo: As we know, it has been predicted by a simulation that the decision pressure is actually dominant in each region in ngc 300 and we see also that, as we move away from the Center, which is a decision here.

111

00:22:20.400 --> 00:22:35.520

Angela Adamo: Eating creases and what do we argue in the favorites that eating pieces and because of the Middle East, it is becoming lower you see here the mentalist the range the bonuses and therefore the spectrum.

112

00:22:36.540 --> 00:22:45.900

Angela Adamo: Of the units of the financing spot stars is harder and also started does is less.

113

00:22:47.760 --> 00:22:50.700

Angela Adamo: than or less important.

114

00:22:51.930 --> 00:22:52.530

Angela Adamo: So.

115

00:22:54.810 --> 00:23:00.060

Angela Adamo: Yes, decided the conclusion of this work, then recently it has appeared in the literature.

116

00:23:00.480 --> 00:23:10.080

Angela Adamo: The fun use survey they ever looked at age to region in 19 spiral galaxies this time that a solution is a bit lower, so we are at 50 per SEC.

117

00:23:10.590 --> 00:23:23.910

Angela Adamo: And what they see essentially is that when we compare the pressure term so when we sum up the feedback The pre supernova feedback, so the third month pressure which is region to region, pressure.

118

00:23:24.330 --> 00:23:44.190

Angela Adamo: The direct pressure and when the pressure usually so in their analysis they have evidence that H two regions are already expanding so other our other pressurized with respect to the pressure here, you see, of the meat plane this, so this is the pressure that.

119

00:23:46.440 --> 00:23:55.860

Angela Adamo: Were H two regions so it's the pressure of the disparate two regions are expanding so in general, although the they have different.

120

00:23:56.160 --> 00:24:03.990

Angela Adamo: Ways of estimating this pressure terms, so there isn't that are bit more ambiguous here in the in the case that.

121

00:24:04.800 --> 00:24:13.500

Angela Adamo: Pressure are estimated in different way I have extra slides so if a want to go more into detail, we can discuss this further.

122

00:24:14.130 --> 00:24:24.000

Angela Adamo: But I want to focus on the analysis, the lorenzo's done so, we have looked at them at three again we have a beautiful data set with a dusty.

123

00:24:24.870 --> 00:24:32.490

Angela Adamo: We have also on my data at the time we look at the view splitter that about databases that are coming for this galaxy.

124

00:24:33.330 --> 00:24:45.420

Angela Adamo: And the here, you see the beautiful new, small size of the galaxy here i'm showing in a child far that read this day chant for, while the other bands are continuing the blue and green.

125

00:24:46.230 --> 00:24:56.910

Angela Adamo: And so, you see, essentially, that the galaxies forming a lot of stars that are beautiful H two regions, we have a paper out to the next week, where we present the data set.

126

00:24:57.300 --> 00:25:10.620

Angela Adamo: But today I focus on page two regions so here, you see an image of the HR for mission and the problem has been to actually break down these two regions, because you see that actually.

127

00:25:12.870 --> 00:25:14.370

Angela Adamo: apply so data or.

128

00:25:15.390 --> 00:25:26.580

Angela Adamo: close up together, especially in these regions awareness that formation is very high, so we have actually manage and implemented the methodology to break up the regions.

129

00:25:26.910 --> 00:25:34.620

Angela Adamo: We ever the cluster population we even the deck spectroscopic clearly warfare yet so we know where we're afraid star star.

130

00:25:36.180 --> 00:25:47.970

Angela Adamo: And we already knew in this galaxy that the cluster formation efficiency is changing significantly from the Center to the outskirts So it goes from roughly 30%.

131

00:25:48.450 --> 00:26:02.160

Angela Adamo: To a few percent and we know that the truncation mass is declining, and this decline in the maximum muscle, we can see it also in the very youngest population when the muse field of view.

132

00:26:02.640 --> 00:26:16.500

Angela Adamo: is located So these are the properties of the data two regions, you see that, essentially, the regions in in the region so in the Center where there is an ongoing starbucks are very luminous.

133

00:26:16.950 --> 00:26:29.430

Angela Adamo: And, but then, so the average trends, the client down, you see, also, that if the regions contain cluster data on average more luminous than the sample.

134

00:26:30.420 --> 00:26:43.290

Angela Adamo: And you see also that they're ready I are roughly 20% so we we do a bit better than we do significantly better so we, we see that two regions, they will dissolve that idea.

135

00:26:44.160 --> 00:27:00.090

Angela Adamo: And so I brought it to them at eliciting gradient, which is very close to the one that reported by a study of wrestling in 2006 with hundred region, while we are adding here 4000 more.

136

00:27:01.050 --> 00:27:12.000

Angela Adamo: And then, finally I think what is significant, also for the next part is that the density is changing dramatically from region to region that are forming in the Center of the cluster.

137

00:27:12.540 --> 00:27:34.770

Angela Adamo: and H two regions which are then for me in the disc of the system and, in fact, when we brought to the pressure terms, so now we are again this this date to region pressure, and this is the direct radiation pressure we see again that age to sort them the pressure of the.

138

00:27:35.940 --> 00:27:45.900

Angela Adamo: Of the pressure of the regions dominate the the the feedback in the H two regions and.

139

00:27:47.790 --> 00:28:00.000

Angela Adamo: We see also that in the Center this is so, we see that the right pressure actually increases, it becomes quite high and compatible almost for this regions.

140

00:28:00.600 --> 00:28:19.650

Angela Adamo: We see also that the 10 month pressure declined significantly with the radius as function of color to set distances why the direct pressure seen some more depending on the local condition of data to region, so this thing quite flat.

141

00:28:21.240 --> 00:28:35.310

Angela Adamo: If we look at the cluster the direct pressure and decision pressure is very high, for very young cluster so cluster younger than 200 years and then, if the if the rapid rapidly their clients.

142

00:28:35.790 --> 00:28:48.030

Angela Adamo: This is possibly due to the evolution of hd region and dusted destruction in age two regions, while they indecision pressure seems to be flattening in this area.

143

00:28:48.750 --> 00:28:57.210

Angela Adamo: And again, we see high pressure in regions that are for me more massive cluster So then, what I do.

144

00:28:57.960 --> 00:29:12.360

Angela Adamo: What we did together lorenza is to compare the average value of the to pressure terms with the pressure of the meat plane so of the disk and what do we see clearly is that.

145

00:29:12.690 --> 00:29:35.280

Angela Adamo: In the Center of the of the galaxy actually two regions seem to be a stable against expansion, they are can in equilibrium, while in the in the outskirts we see that the pressure in the region to region it's higher than the meat plane pressure so they are expanding so.

146

00:29:36.540 --> 00:29:44.760

Angela Adamo: I will skip this slide about the escape of uranus uranus in radiation and simply summarize that.

147

00:29:46.800 --> 00:30:01.290

Angela Adamo: Young sacristy population keep in their property stress of the environment, where they formed and that we see strong evidence of age to region evolution is driven by please open our feedback.

148

00:30:02.310 --> 00:30:21.240

Angela Adamo: But this is this is true for a typical average la Casa forming galaxies or, this is not true for legion with the high pressure, like the Center in MIT three and those regions are the one which are more similar to either shoot galaxies so maybe this.

149

00:30:22.770 --> 00:30:28.020

Angela Adamo: This conclusion that pre supernova feedback drives.

150

00:30:29.490 --> 00:30:34.560

Angela Adamo: The evolution of H two regions is not true what clickable a title issues.

151

00:30:36.030 --> 00:30:47.580

Angela Adamo: And then, yes i'm at the end and I have a few slides about the database, the program So if you want, I can cover it more than says yes okay.

152

00:30:48.600 --> 00:30:58.620

Angela Adamo: Then, so now, the next step is actually can we time the this the young sacristan imagine face.

153

00:30:59.010 --> 00:31:12.180

Angela Adamo: And until now spitter the solution has been a kind of humping the promises for local galaxy right, we had the huge progresses for understand the Milky Way, but we are kind of.

154

00:31:12.690 --> 00:31:22.320

Angela Adamo: We stop there, right so can we extend this studies at all, no galaxies and that we can actually so here.

155

00:31:23.040 --> 00:31:43.020

Angela Adamo: I show, for example, start class that have been used in the past to understand like how fast the process of to region expansion is observation on it right so here, you see brad with more in 2011 show that actually looking at the morphology of age to be done, we can understand.

156

00:31:44.520 --> 00:31:50.820

Angela Adamo: How fast this imagine faces and actually we use cluster ages to.

157

00:31:51.750 --> 00:32:03.660

Angela Adamo: Time this evolution and the word we ever conclude is roughly that it would take between two and 5 million years for an edge to region to evolve and becomes.

158

00:32:04.020 --> 00:32:13.710

Angela Adamo: Here exposed and this several times case i've been also published by the finance team, using the a different methodology.

159

00:32:14.070 --> 00:32:24.630

Angela Adamo: But the boss, so the way we have analyzed like looking at the cluster and H hl for morphology and the this work by shantytown.

160

00:32:25.110 --> 00:32:45.150

Angela Adamo: They are anchored by the fact that we do not see them bedded faces in both tracers so what what What I mean is, essentially, we look here, this is us, the filming region in a nearby local galaxies and you see in the yellow is the contour of the.

161

00:32:46.470 --> 00:32:50.220

Angela Adamo: muscle, where the dense gas golden's gases and.

162

00:32:51.360 --> 00:33:01.170

Angela Adamo: In China, we see the spitzer so essentially for this is telling us that there is a very deeply embedded region that is forming stars, but we cannot.

163

00:33:02.580 --> 00:33:09.510

Angela Adamo: So we have not been able to study this type of region in outside of the Milky Way we see here that.

164

00:33:09.870 --> 00:33:18.990

Angela Adamo: With the passion beta that actually in this region, a star formation, as already started this uniting glasses, are these are ultra compact H two regions.

165

00:33:19.470 --> 00:33:24.870

Angela Adamo: And then you will see that the more class model, the region are evolving right.

166

00:33:25.350 --> 00:33:35.430

Angela Adamo: So, essentially, we have been blind to this face and then now in local galaxies and the for this region, the cluster aging is highly uncertain.

167

00:33:35.910 --> 00:33:50.040

Angela Adamo: So, to improve on our statistics we are looking now at the sample of local galaxies you see here in white in the red the footprints of the Midi and need come coverage of this galaxies.

168

00:33:50.460 --> 00:34:02.610

Angela Adamo: And we are covering galaxy which are typical spiral arms galaxies in the local universe, we are covering or so more loma felicity start bursting door for like in DC for for nine.

169

00:34:02.940 --> 00:34:21.600

Angela Adamo: and other to dwarf galaxy so which are actually interacting, so this is one of the other system, and I will stop here so

essentially there is there will be a lot of science and if you are interested, I can tell you a bit more of what fields that we will cover for this program.

170

00:34:24.900 --> 00:34:25.200

Oh.

171

00:34:26.880 --> 00:34:30.180

Sarah Jeffreson: Thank you so much.

172

00:34:35.850 --> 00:34:40.740

Sarah Jeffreson: Interesting talk I just like.

173

00:34:47.820 --> 00:34:51.300

Sarah Jeffreson: To say questions.

174

00:34:52.500 --> 00:34:57.540

Sarah Jeffreson: In the chat and i'll just use.

175

00:35:04.080 --> 00:35:05.190

Sarah Jeffreson: The host of.

176

00:35:09.480 --> 00:35:11.130

Sarah Jeffreson: Do it the first one here.

177

00:35:12.930 --> 00:35:16.080

Sarah Jeffreson: So yeah so.

178

00:35:18.090 --> 00:35:23.310

Sarah Jeffreson: He arrest and like, particularly as this later.

179

00:35:28.260 --> 00:35:28.890

Sarah Jeffreson: interest.

180

00:35:30.150 --> 00:35:30.810

Sarah Jeffreson: In like.

181

00:35:32.850 --> 00:35:33.600

Sarah Jeffreson: The opposite.

182

00:35:35.160 --> 00:35:36.060

Sarah Jeffreson: There is no.

183

00:35:38.400 --> 00:35:42.990

Sarah Jeffreson: Trains that can be placed on.

184

00:35:44.250 --> 00:35:45.150

Sarah Jeffreson: The energy.

185

00:35:50.310 --> 00:35:56.550

Sarah Jeffreson: And some injected pilot H two.

186

00:35:58.380 --> 00:35:59.220

Sarah Jeffreson: regions.

187

00:36:02.340 --> 00:36:03.060

Sarah Jeffreson: cloud.

188

00:36:07.380 --> 00:36:09.450

Sarah Jeffreson: Jay tell us.

189

00:36:12.390 --> 00:36:15.420

Sarah Jeffreson: To survey.

190

00:36:16.860 --> 00:36:18.120

Sarah Jeffreson: Particular.

191

00:36:19.980 --> 00:36:24.240

Sarah Jeffreson: It will be really interesting in that.

192

00:36:26.010 --> 00:36:27.870

Sarah Jeffreson: regard and.

193

00:36:28.920 --> 00:36:32.700

Sarah Jeffreson: Just partnering if you.

194

00:36:34.350 --> 00:36:37.110

Sarah Jeffreson: be able to say anything.

195

00:36:39.330 --> 00:36:40.440

Sarah Jeffreson: about the.

196

00:36:44.700 --> 00:36:47.040  
Sarah Jeffreson: dependence of the.

197

00:36:48.480 --> 00:36:50.580  
Sarah Jeffreson: Radiation and.

198

00:36:54.030 --> 00:36:54.810  
Sarah Jeffreson: pressured.

199

00:37:00.360 --> 00:37:03.390  
Sarah Jeffreson: On Ted city.

200

00:37:05.190 --> 00:37:11.070  
Sarah Jeffreson: like this around in cloud, in which, like.

201

00:37:13.350 --> 00:37:14.100  
Sarah Jeffreson: The h.

202

00:37:15.510 --> 00:37:15.780  
Sarah Jeffreson: two.

203

00:37:17.220 --> 00:37:18.000  
Sarah Jeffreson: Page and is.

204

00:37:19.320 --> 00:37:19.920  
Sarah Jeffreson: Adding.

205

00:37:21.480 --> 00:37:22.650  
Angela Adamo: yeah so.

206

00:37:23.970 --> 00:37:39.480  
Angela Adamo: Unfortunately, we do not have either we do not have in our  
in our analysis, the pressure into so the depression, the H two regions  
right the turbulence pressure in in general across clouds.

207

00:37:41.220 --> 00:37:59.820  
Angela Adamo: But the pressure term so if if I will look for this, and so  
we see that the valuation are going from so are quite high So there we go  
from a log scale from seven to roughly 5.5 in change in.

208

00:38:00.690 --> 00:38:11.040

Angela Adamo: In the pressure, this is the third month pressure that you, you were suggesting, but what is interesting, so you see that this decline in the.

209

00:38:12.150 --> 00:38:29.430

Angela Adamo: In the 10 much pressure, it also reflects the decline that we see in the gut surface density of the disk and the decline that we see, then, if we sum up that pressure with this, so the media plane pressure we take on the disk the pressure in the disk.

210

00:38:30.090 --> 00:38:40.020

Angela Adamo: We see that the essentially looks alike, that the condition in the in the gas outside of data to regions is actually driving that pressure term.

211

00:38:41.760 --> 00:38:59.490

Angela Adamo: quite significantly for the evaluation of the pressures of feedback from Stan cluster a difference of the studied in 2015 actually here we apply stochastic sampling, so we are the stochastic stochastic be creating.

212

00:39:00.840 --> 00:39:16.440

Angela Adamo: Cluster libraries and then we use by Asian metal to feed the cluster so we have a probability distribution function for ages mass extinction, as well as so the only parameter that we are able to account is.

213

00:39:18.120 --> 00:39:20.640

Angela Adamo: The session so.

214

00:39:20.850 --> 00:39:22.320

Angela Adamo: I can tell.

215

00:39:22.650 --> 00:39:35.100

Angela Adamo: For instance, I can tell you how much you and the session this cluster are producing and the forest and what we see is that in an environment like MIT three hour, which is kind of our.

216

00:39:36.510 --> 00:39:50.790

Angela Adamo: twin of our own galaxy there is not much escape radiation produced by the cluster, so this is this plot here so i'm quoting here, what do we derive from the.

217

00:39:51.150 --> 00:40:04.380

Angela Adamo: HR for luminosity of the region and what do we derive from the cluster if he is so if it's the same than a cluster of producing all the utilisation power in this region if it's below.

218

00:40:04.830 --> 00:40:24.300

Angela Adamo: Which is the case in 93 more than 90% of the region clustered are actually not driving any escape fraction from age to region, which is quite puzzling send them because we see that the pressure terms depend on the cluster properties right, this is.

219

00:40:26.100 --> 00:40:33.810

Angela Adamo: This was this trend right, we see that the pressure is high for younger class that is higher for more massive cluster but actually.

220

00:40:34.260 --> 00:40:39.630

Angela Adamo: i'm not driving the escape but addiction, so the feature that we are.

221

00:40:40.500 --> 00:40:59.580

Angela Adamo: motivating in the draft is that the cluster actually do the work of expense, so the cluster feedback is helping expanding that to be done by this caper edition is not coming from the cluster so you need the star formation around the cluster to explain escape tradition from each region.

222

00:41:01.920 --> 00:41:05.610

Sarah Jeffreson: see it, yes, and like it's also.

223

00:41:07.980 --> 00:41:13.200

Sarah Jeffreson: depends on like on the host cloud, I suppose.

224

00:41:13.920 --> 00:41:15.270

Angela Adamo: huh yes.

225

00:41:15.630 --> 00:41:15.960

Yes.

226

00:41:17.160 --> 00:41:17.640

Yes.

227

00:41:19.020 --> 00:41:19.620

Sarah Jeffreson: Okay.

228

00:41:24.030 --> 00:41:25.170  
Sarah Jeffreson: Also, have.

229  
00:41:26.700 --> 00:41:28.290  
Sarah Jeffreson: Comments me here.

230  
00:41:30.840 --> 00:41:31.710  
Sarah Jeffreson: If you'd like to.

231  
00:41:32.820 --> 00:41:33.870  
Sarah Jeffreson: pick up to me.

232  
00:41:41.130 --> 00:41:47.070  
Antony Stark: About about pressure as a function of radius in galaxies.

233  
00:41:48.090 --> 00:42:09.180  
Antony Stark: Important effect which is sometimes forgotten, is the fact that the tidal shear and the galaxy increases very dramatically is going towards the Center and so, if you have an object, like a molecular cloud or a cluster of galaxies cluster galaxy.

234  
00:42:10.320 --> 00:42:19.530  
Antony Stark: cluster of stars rather than that for that object to survive in the Center of the galaxy means that it's.

235  
00:42:20.850 --> 00:42:28.560  
Antony Stark: That it's strongly gravitationally bound and so that permits it to have a higher pressure and.

236  
00:42:29.790 --> 00:42:44.010  
Antony Stark: That kind of thing may not be so important for the rather more disorganized galaxies in the early universe, where there is perhaps not so much concentration toward the Center of the galaxy and they.

237  
00:42:45.210 --> 00:42:46.380  
Antony Stark: may be more.

238  
00:42:47.430 --> 00:42:48.330  
Antony Stark: It may be more.

239  
00:42:49.470 --> 00:42:55.590  
Antony Stark: a collection of random lumps that haven't yet fallen into a dense Center.

240

00:42:57.120 --> 00:43:04.860

Angela Adamo: yeah yeah so you are right, so dynamically the Center of the Milky Way or the Center of me the three are not.

241

00:43:05.880 --> 00:43:14.010

Angela Adamo: The same as turbulent disk thick turbulent this career shift to that's for sure, but they couldn't so.

242

00:43:14.700 --> 00:43:21.600

Angela Adamo: What is similar, I think, is the gas densities, and the fact, so the turbulence.

243

00:43:22.020 --> 00:43:35.910

Angela Adamo: is not driven by the dynamics, so the fact that everything is employing in the Center but the turbulence is driven by the fact, these are sick discuss today shift, so they they have a naturally more to will and.

244

00:43:36.840 --> 00:43:49.800

Angela Adamo: What you are perfectly right in saying that so in the milk in the Center of them MP3 and clouds to survive are harsh environment to really form stars and then that seems.

245

00:43:50.220 --> 00:44:13.800

Angela Adamo: To be very massive that will natural form is that cluster and more massive star cluster in but and their feedback is very strong, so we see that the pressure is very high in this age two regions, but yet they did not expand so they are like contained in the so they they are not.

246

00:44:15.180 --> 00:44:18.960

Angela Adamo: Have a pressurized let's say with respect to the meat plane.

247

00:44:19.530 --> 00:44:31.410

Angela Adamo: And so, if I think of Irish galaxies and I think that they have a plum so which are attend to the sixth and to the seven solar masses, so their depth into the sixth and seventh stellar months is.

248

00:44:31.980 --> 00:44:44.370

Angela Adamo: Then i'm imagining so they are forming very massive clumps but the turbulence and the pressure in the disk is so high, I wonder whether so to to really get to read of the.

249

00:44:45.120 --> 00:44:49.890

Angela Adamo: cloud destroy it, and the marriage from me and then so so this process.

250

00:44:50.550 --> 00:45:04.860

Angela Adamo: must take a lot more energy so maybe it's a burden of the feedback, it can be disregarded so weekly or maybe longer galaxy cannot tell those stories right or what is happening today shift.

251

00:45:05.250 --> 00:45:13.200

Angela Adamo: So we need to control when we want to understand how it to regions how star cluster form, and then they evolve.

252

00:45:13.710 --> 00:45:23.250

Angela Adamo: at different redshift, we need to control, also the environment where this is happening and, of course, if we will look a very high ratios are beyond the ratio to.

253

00:45:23.610 --> 00:45:36.780

Angela Adamo: We are looking at the low mass galaxies and there's some in this galaxy so lower Middle East so, then this is indirect another condition for cluster formation, which is actually interesting.

254

00:45:38.070 --> 00:45:39.240

Angela Adamo: To follow you.

255

00:45:39.720 --> 00:45:56.100

Antony Stark: Know an observational diagnostic that may help understand this with Alma is to look at at the various like every species that only admit at high density So you see, for example, that hcm.

256

00:45:57.450 --> 00:46:07.920

Antony Stark: is predominantly emitting in the centers and that's because some like of the clouds there are simply a lot more dense than the molecular clouds in the outer part of it, this.

257

00:46:08.670 --> 00:46:17.550

Angela Adamo: In fact, the yes, a huge amount in me now is the long more as done ASEAN study of the Center in mid three and they find some beautiful.

258

00:46:18.630 --> 00:46:30.690

Angela Adamo: compact region, so there is yeah there is this conveyor belt type like in the Milky Way, so this is flowing from the bar into the Center and creating a starburst in that region.

259

00:46:31.050 --> 00:46:45.690

Angela Adamo: But I did a difference of the Milky Way where a star formation, maybe not so efficient that right now cluster formation in MP3 it's a really efficient so in the only in the Center we have a more than hundred cluster.

260

00:46:47.040 --> 00:46:52.170

Angela Adamo: detected so it's like is forming clusters, at the very high rate.

261

00:46:54.360 --> 00:47:01.470

Angela Adamo: So yeah it's it's interesting men yeah I haven't done this yet, but I know that there are studies out there.

262

00:47:05.820 --> 00:47:06.570

Sarah Jeffreson: Yes.

263

00:47:11.610 --> 00:47:11.940

Sarah Jeffreson: that's.

264

00:47:13.500 --> 00:47:14.460

Sarah Jeffreson: very interesting.

265

00:47:16.890 --> 00:47:17.790

Sarah Jeffreson: We now have.

266

00:47:19.710 --> 00:47:20.700

Sarah Jeffreson: two.

267

00:47:22.950 --> 00:47:24.090

Sarah Jeffreson: questions.

268

00:47:28.740 --> 00:47:29.010

Sarah Jeffreson: here.

269

00:47:30.720 --> 00:47:31.140

Sarah Jeffreson: We have.

270

00:47:35.640 --> 00:47:54.330

Vadim Semenov: Hello hi hi everyone Thank you really just talk yeah good question so first do you see in trance office different pressure components and they should origin, so the functional size of the region and so can be interpreted as like some evolutionary.

271

00:47:55.530 --> 00:47:58.320

Vadim Semenov: trance okay can can can can.

272

00:47:59.520 --> 00:48:02.970

Vadim Semenov: Give us any insights about this devotional mission which is.

273

00:48:04.200 --> 00:48:15.000

Angela Adamo: So the quick answer is, we checked and we don't but, so let me know I don't think I have, I have a problem with the radius.

274

00:48:15.570 --> 00:48:22.680

Angela Adamo: Here I simply show the radius of the galaxies right, but what you see is the descriptor is huge in the Idi.

275

00:48:23.100 --> 00:48:32.820

Angela Adamo: Of course, this trend, this do in this case to factor that in the Center there so bright will miss the low ones here at the very Center.

276

00:48:33.270 --> 00:48:43.050

Angela Adamo: But this gap, there is huge and the fact is that you ever age to be jenna different evolution throw out to the disk.

277

00:48:43.530 --> 00:48:49.770

Angela Adamo: And then also is true that the latest depend on the pressure terms.

278

00:48:50.340 --> 00:49:08.280

Angela Adamo: But the red is the so, but it will depend, also on the financing or additions on the cube you're not that strong green sphere definition and how are the skew our high school so maybe the factor we don't see the dependence is simply we.

279

00:49:09.300 --> 00:49:10.290

Angela Adamo: it's not so easy.

280

00:49:11.100 --> 00:49:13.530

Vadim Semenov: To see I guess it sort of depends on the environment, like.

281

00:49:13.620 --> 00:49:14.400

Vadim Semenov: Just just.

282

00:49:14.550 --> 00:49:21.930

Angela Adamo: yeah, but if you look at, so there is a not really a dependence that with the data centric distances, while we see the dependency.

283

00:49:22.530 --> 00:49:36.750

Angela Adamo: In the in the pressure terms right so yeah we we check the specifically if they've written in the imagery Center at a smaller, but they are not with respect to the average so.

284

00:49:38.940 --> 00:49:39.360

Vadim Semenov: Especially.

285

00:49:41.790 --> 00:49:57.390

Vadim Semenov: And so the second question was about this program we should measure that then so, can you can have so much detail so what kind of constraints, the unexpected put on the stage can it can it can seem about a degeneration, or they can depends on vironment.

286

00:49:58.800 --> 00:50:02.430

Angela Adamo: So essentially what we have a tested this that.

287

00:50:02.490 --> 00:50:04.320

Angela Adamo: If we are gonna get.

288

00:50:05.580 --> 00:50:14.250

Angela Adamo: we're gonna get the good handling of the continuum of embed the cluster So you see, we we sample a lot to the.

289

00:50:14.790 --> 00:50:31.110

Angela Adamo: CD so the spectral energy distribution using continuum filter and we have also a hydrogen recombination lines, so the passion of the bracket alpha so the whole our motivation is then.

290

00:50:32.130 --> 00:50:33.330

Angela Adamo: To look the sorry release.

291

00:50:34.800 --> 00:50:49.170

Angela Adamo: I like I like very much this region, so what we hope is to see in regions embedded like this to detect the PA to mission, so the one 3.3 and 3.7 monitoring.

292

00:50:49.710 --> 00:51:04.020

Angela Adamo: and hopefully the bracket alpha so the format for micron that will tell us that already the massive stars are reaching the main sequence, so we should see some for the session ongoing.

293

00:51:04.470 --> 00:51:14.790

Angela Adamo: Here in this region here, so we, and if we get to the bracket alpha we get an upper limit on date so and it will be.

294

00:51:15.600 --> 00:51:25.290

Angela Adamo: We don't know actually how fast the cluster goal or stuff for mentioned was right, we, we will not look at cluster, we will look at the cluster at the star formation.

295

00:51:25.680 --> 00:51:37.320

Angela Adamo: We don't know faster it to region evolved from here to here to here and then what we know is that in between two and 5 million years we are here.

296

00:51:37.890 --> 00:51:51.120

Angela Adamo: So in the beautiful age two regions, we are used to see with the hub, so there is clearly an evolution and how long it takes it depends on on how many cluster we miss.

297

00:51:51.630 --> 00:52:02.850

Angela Adamo: Because right now, plus the window decal we detected those of that along the line of sight can emit in optical towards our direction at this very young faces, so we have a dramatic effect.

298

00:52:03.540 --> 00:52:16.500

Angela Adamo: To include and yeah, we need to really get look deep into the the embedded face, and we know we cannot do that within the medium flooded.

299

00:52:17.400 --> 00:52:28.140

Angela Adamo: So now so quantitative Lee we expect to find more than 10,000 embedded regions in this over the six galaxies.

300

00:52:28.680 --> 00:52:41.940

Angela Adamo: And we expected that roughly 5% of these are more massive than tend to the for solar masses, so we, we hope to also trace that the conditions.

301

00:52:42.300 --> 00:52:49.500

Angela Adamo: When you form a very massive or significantly massive star cluster because, for that those regions feedback.

302

00:52:50.130 --> 00:53:08.580

Angela Adamo: effect can be so it can take longer to actually trace this face and again, we will look at the environment and dependencies so if we are in the Center of spiral galaxies if we add in there are more in that arm if we are in a starbucks to dwarf so then.

303

00:53:09.600 --> 00:53:24.330

Angela Adamo: Then, so we expect the validation and we expect to have the numbers to actually drive conclusion because statistically, we expect thousands of object in the in the different categories that we are.

304

00:53:28.470 --> 00:53:29.640

Vadim Semenov: Thanks very.

305

00:53:30.810 --> 00:53:31.110

Vadim Semenov: Much.

306

00:53:33.750 --> 00:53:36.120

Sarah Jeffreson: So we just have a few.

307

00:53:37.140 --> 00:53:38.040

Sarah Jeffreson: minutes.

308

00:53:40.860 --> 00:53:41.310

Sarah Jeffreson: Now.

309

00:54:02.310 --> 00:54:03.150

Sarah Jeffreson: box to.

310

00:54:04.200 --> 00:54:05.250

Sarah Jeffreson: summarize.

311

00:54:09.180 --> 00:54:09.450

Sarah Jeffreson: here.

312

00:54:11.220 --> 00:54:11.700

Angela Adamo: Yes.

313

00:54:13.380 --> 00:54:13.710

Sarah Jeffreson: yeah.

314

00:54:14.850 --> 00:54:15.360

Angela Adamo: yeah.

315

00:54:17.370 --> 00:54:33.630

Angela Adamo: very interesting and intriguing system, and we are actually reaching now the the face, so we are reaching now the opportunity to resolve them in simulations or a way to simulate them.

316

00:54:34.470 --> 00:54:48.030

Angela Adamo: within their asked the galaxy, so we are actually able to look at the environment that dependency in their formation and evolution and that we did publicity, we are gonna look at their bury.

317

00:54:49.440 --> 00:54:53.910

Angela Adamo: The other initial phases and hopefully.

318

00:54:54.960 --> 00:55:10.800

Angela Adamo: integrates studies of the Milky Way with other local galaxy so look at other environment and extend what we have learned from our Milky Way Indo Indo audition that shows a bit what is happening in the local universe.

319

00:55:12.060 --> 00:55:19.980

Angela Adamo: yeah i'm very thankful for your time, and you have been listening and for your questions.

320

00:55:27.360 --> 00:55:28.350

Sarah Jeffreson: Thank you so.

321

00:55:31.230 --> 00:55:31.800

Sarah Jeffreson: Much.

322

00:55:33.480 --> 00:55:35.400

Sarah Jeffreson: super interesting.

323

00:55:41.400 --> 00:55:41.970

Sarah Jeffreson: talk.

324

00:55:46.200 --> 00:55:47.010

Sarah Jeffreson: Thank you.

325

00:55:49.980 --> 00:55:53.850

Sarah Jeffreson: who attended today and see.

326

00:55:57.840 --> 00:55:58.440

Sarah Jeffreson: You all.

327

00:56:01.770 --> 00:56:04.680

Sarah Jeffreson: next semester so.

328

00:56:06.270 --> 00:56:07.140

Angela Adamo: enjoy your.