POSTER PAPERS - SESSIONS 7 and 8.

Chairman : A.MAEDER.

Maeder:

There are very few posters to be discussed today, and before going these I thought I would show some "nice" comments pronounced during the meeting:

(i) Conti: "I know we are in a spiral galaxy, but I have a lot of trouble in seeing spiral arms"
(ii) Concerning agreement between data and theory; Kudritzki has said: "you cannot see it because the agreement is so good"
(iii) Joe Silk: "the fact we don't know anything does not restrain theorists from studying star formation"
(iv) Peter Conti: "how do we make a superstar by Hans Zinnecker"
(v) Hodge: "when you look to associations in other galaxies you must have good reasons for making your life more difficult"
(vi) Hoessel: "the facts are just clear enough for publication" - I wonder whether the observations are also so clear!
(vii) Wheeler: "this is the total number of supernovae in units of a few".

Turning now to the posters, we have a series of papers from Chiosi and co-workers discussing the effects of overshooting on the morphology of the HRD and integrated colours of clusters in the range of intermediate mass stars together with the distance modulus of the LMC where they get a better fit with overshooting and age estimates of various star clusters in the LMC where again the inclusion of overshooting provides better results.

Feast:

If I remember correctly the paper of Chomer et al. also did a comparison with observed HR diagrams. Does that fit with your changes resulting from the different theory?

Chiosi:

The major difference is in the following. Those particular clusters belong to a particular class of clusters which show, in our opinion an atypical morphology of the HRD, since on the basis of standard theory they should develop a red giant branch whereas the red stars lie in a clump. This is also evident looking at the red giant luminosity function. This means that the theory is not applicable in

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this domain of cluster ages. In the paper of Bressan, et al., on the minimum mass and maximum mass for stars undergoing a helium burning phase, they have found this value, instead of 2.2 $M_\odot$ in classical models, is now down to 1.6 $M_\odot$. Actually they are able to confine the mass limits in a very narrow band. This means that stars as old in mass as 1.6 $M_\odot$ will not develop a red giant phase but will burn helium in the core as for massive stars. This leads to the fact that the red giant luminosity function is a single sequence as indicated by the observed data. As a consequence of this result the new distance modulus comes out immediately in the sense that overshooting models at any given age are brighter than standard models, so for a given apparent absolute magnitude it is obvious that if they found a distance modulus of 18.2 with the new models we have to find a slightly higher distance, namely 18.6.

Maeder:

I would like to mention the paper dealing with luminous stars in SMC-associations, where, if I understand correctly the results are very preliminary.

Kaufman:

What are the stellar types in the associations?

Kontizas E.:

From the diagrams we show, there are mainly early-type stars. There seems to be a lack of late-type supergiants, but this is preliminary. We cannot distinguish B and A stars, so we call them BA stars.

Maeder:

One has to be very careful about overshooting to get just the right amount of this physical effect. I think that one needs to compute the details of the internal chemistry in order to compare with evolutionary observational results in order to confirm or reaffirm the existence of this process in massive stars. Further progress including turbulent diffusion, overshooting and so on will slightly modify the result, but presently we come out with 40 to 50 $M_\odot$.

Maeder:

The next poster, deals with a search for WR stars in giant extragalactic regions by Campbell, Smith and Terlevich. They have found

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spectra of four HII galaxies showing WR features and additionally a large CO index showing evidence of red supergiants which anticorrelate with the WR features.

Zinnecker:

How secure are the CO indices; they are very difficult to measure. One problem for instance is that a measurement of the CO index distinguishing between giants and supergiants is difficult. Maybe you have an old underlying population of giants.

Campbell:

You have to do very accurate photometry, needing about 5 to 10 observations or better. We do not really have enough observations and our first results thus need to be confirmed. However, I believe that our technique is a powerful one for detecting red supergiants unambiguously.

Massey:

In his thesis, Howard French studied a few HII galaxies and reported HeII 4686 emission, but he sort of missed the point and simply assumed it was nebular. Did you do any of the galaxies he did, and what was the HeII 4686 due to?

Campbell:

We do have some common objects. The 4686 in our sample is very narrow HeII emission; using ordinary O stars you would need temperatures greater than say 150,000 K to produce a narrow HeII line, but I am not sure whether they can do this without also producing other, possibly broad, features which are not observed. This HeII emission is always observed in the very high excitation, low-abundance, regions and we do not know how it is produced.

Maeder:

Finally we come to the paper dealing with "Warmers" by Melnick and Terlevich where the emphasis is put on the star-burst model. They show that the contribution of WC and WO stars, which they call "warmers" might just give the emission spectra observed in active nuclei, which would appear after two or three million years according to this work.

Silk:

I think this is a very exciting idea. However, it seems to me that on the basis of the model, you would get Seyfert-like features in HII regions where one expects a weak metallicity.

Campbell:

I can perhaps answer for Terlevich. The reason you do not see these features in HII regions is simple. Firstly, you need an extremely massive burst of star formation to produce these stars massive enough. Secondly you need a very high density and you probably need solar abundances.

Silk:

Surely there must be a giant HII region somewhere with about solar abundances?

Campbell:

There is not an HII galaxy like that.

Melnick:

There are some nuclei that have intermediate characteristics and there are some giant HII regions (cf. the spectrum of NGC 5253 I showed in my talk) that have nebular HeII 4686 that you do not expect from a normal population of O stars).

Maeder:

Perhaps starburst models are slightly more conservative than "monsters" and this is clearly a very interesting line of research. We have a little time for any further discussion of today's reviews.

Zinnecker:

A brief comment ont the question of mass at which the bi-modal star formation is cut into two pieces with a separating mass of 3 $M_{\odot}$. I think that mass can be justified to some extent, as was mentioned, but I would like to emphasise the point, by the near-IR, 4 micron, observations. The fact is that we need to explain this IR excess in the 5 kpc arm by lots of giants, but at the same time you must satisfy the requirement that the scale height of these stars is not too high as the

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observations show. Now, in order to do that you must not allow the stars any time to disperse in this direction and that puts a limit on their age and that is another reason, I think, why the limit cannot be around 1 M_o, but must be somewhere around 2 to 3 M_o so that the lifetime we are talking about is around 10^8 years.

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