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## THE CELESTIAL PC

By Mike Kibat

The *Saguaro Astronomy Club Database Version 5.0* (SAC 5.0) is a comprehensive database of non-stellar, deep-sky objects. It is a labor of love, largely assembled by the members of the Saguaro Astronomy Club of Phoenix. The list of contributors numbers 24--both amateur and professional astronomers.

The database is huge--over 10,300 objects are listed with considerable detail. A hard disk is a necessity because the complete database requires almost three megabytes (MB)! On my MS-DOS machine, once all files were un-archived and assembled into a dBase III format database, the total disk requirement was approximately 2.9 MB. Just the dBase III format database alone requires almost 2.4 MB. If you just want the text version of the database, it will take up a little over 1.2 MB.

The format for the database--ASCII fields separated by commas and delimited with double quotation marks--was chosen to allow the widest distribution, across varied hardware platforms and for use with many types of database, spreadsheet or word processing software.

A typical entry appears to be:

"NGC 1952","M 1","PLNNB","TAU","05 34.5","+22 01","8.4",  
"135/136","5","vB,vL,E135,vglbM,r","6'X4","E","","","Crab Nebula,Rosse  
saw filaments,cent pulsar 16 mag,3c144","N,B"

The 16 data elements are defined as:

- 1.OBJECT: NGC number. If none exists, an alternate name is used.
- 2.OTHER: Other catalog designation.
- 3.TYPE: Type of object (i.e., asterism, bright nebula, open cluster, etc.).
- 4.CON: Constellation in which the object is found.
- 5.RIGHT ASCENSION: 2000.0 coordinates, format is HH MM.M.
- 6.DECLINATION: 2000.0 coordinates, format is DD MM.
- 7.MAGNITUDE: to the nearest 10th.
- 8.U2000 CHART: Uranometria 2000 chart upon which the object is located.
- 9.TIRION CHART: Sky Atlas 2000.0 chart upon which the object is located.
- 10.VISUAL DESCRIPTION: Gleaned from a number of sources

(Burnham's, Sky & Telescope, etc.). The descriptions are given using the NGC and Burnham's notations.

11.SIZE: In minutes or second of arc.

12.CLASS: Any of several professional classifications schemes.

13.NUMBER OF STARS: Within a cluster.

14.BRIGHTEST STAR: Magnitude of brightest star in cluster or central star of a planetary nebula.

15.NOTES: Miscellaneous information.

16.SOURCE: Source of information for object.

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## ANNOUNCEMENTS

The April and May meetings will be on April 3 and May 1, respectively, at the Science Museum. The programs have not yet been set but the information will be put on the phone line (643-4092) as soon as it is available.

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The following yearly handbooks are available: Continued on page 2

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**NOTICE** Exchanges and contributors, please note that the address for Gemini has changed to: 15710 County Road 9, Apt. 209, Plymouth, MN 55446-2608. Telephone (612) 550-1254.

## ANNOUNCEMENTS

Oct. 19 or 20 - Metcalf

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the *Observer's Handbook* from by The Royal Astronomical Society of Canada, \$11; Guy Ottwell's *Astronomical Calendar*, \$13; the *Floppy Almanac* from the U.S. Naval Observatory, \$6 for the disk, \$2 additional for the manual. These will be available at meetings until sold out. If you would like more information on these publications or if you would like to have one mailed to you, call Max Radloff.

We also have copies of the Arizona Database, containing information on over 16,000 deep sky objects. The club has the IBM and Amiga versions and the Macintosh version is available through the mail.

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The annual convention of the North Central Region of the Astronomical League will be held on Saturday, April 28, in Madison, Wis. Speakers will be Lowell Doherty and John Mathis from the University of Wisconsin.

There will also be an open house on both Friday and Saturday night at the Madison Astronomical Society's Carl Fosmark Observatory. Amateurs are invited to give papers and enter the photo and art contests. Registration forms will be available at the meetings through April or can be obtained from Max Radloff.

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The dates for the remaining 1990 star parties are given below. Star parties will be on Friday evenings, with Saturday as an alternate in case of bad weather. Weather information will normally be on the phone line (643-4092) after 6:30 p.m. on the date of the star party. In the event that the information does not get on the line, you can get it from Lauren Nelson, 644-1254.

## GEMINI

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"Gemini" is published semi-monthly, with occasional special editions, by the Minnesota Astronomical Society, an affiliate of the Science Museum of Minnesota, 30 East 10th Street, St. Paul, MN 55101.

All members of the Society receive "Gemini." Non-members may subscribe to "Gemini" for \$8 per year by sending a request and enclosed check made out to "MAS" to the editor at the address listed above.

Send articles and exchanges directly to the editor. Articles for publication are due the 15th day of the month preceding the month of publication. This is usually the same as the 15th day of the month following the month of publication of the preceding issue.

April 27 or 28 - Baylor  
May 25 or 26 - Ryan-Chase Observatory, Clear Lake, Wis.  
June 22 or 23 - Metcalf  
July 20 or 21 - Baylor  
July 27 - at a northern site to be named later  
Aug. 11 - Metcalf (Perseid meteor shower)  
Aug. 17 or 18 - Metcalf  
Sept. 21 or 22 - Baylor

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Most members are probably aware of the news, but Northern Sky Telescopes went out of business at the beginning of February. Jon Chase and the rest of the staff were always friendly and helpful to MAS members and his store will be missed. Many members were at the going-out-of-business sale and the club was able to get some items for the observatory, including some Televue eyepieces.

The May star party is still scheduled for the Ryan-Chase Observatory in Clear Lake, Wis. Jon said that they are in the final stages of installation and the observatory may well be done by the star party.

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The quickest way to Clear Lake is to go east on I-94 and then take US 63 north to Clear Lake. Check your odometer at the junction of 63 and County JJ. Stay on 63 for 1.3 miles, turn right on 40th Street, and then right into the first driveway. This is Dick Ryan's home. If you get lost and need to call, his telephone number is (715) 263-3342.

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A special thank you from the MAS goes out to Sherman Schultz who coated the mirrors made in Don Day's mirror making class for free. Sherman also donated one of the telescopes that will go in the observatory.

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The club is looking for donations of eyepieces to use with the telescopes that it loans out. If you have upgraded your eyepiece collection and have any extras that you don't use, we would appreciate any donations.

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The following announcement should have appeared an issue or two ago, but was inadvertently omitted. The MAS has established two funds for special projects. One is a memorial fund for Craig Shurr, a long-time MAS member who died last spring. The money in this fund will be used to buy something special for the observatory as a remembrance of Craig and of his love of astronomy.

The other fund is to build a warming house at Metcalf. We can't afford this out of the regular budget, but if each member puts in \$5 we can have a 12 x 12 building where people can warm up and have a cup of coffee.

If you would like to contribute to either of these funds, send a check to Dick Nelson, our trea **Continued on page 3**

## ANNOUNCEMENTS

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surer, with a note that it should go toward the Craig Shurr memorial or the Metcalf warming house.

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The Texas Star Party will be May 20- 28. If you are planning on attending, you should know that they are discouraging on-site registration. Registration by mail is \$23, at-the gate \$75.

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Astronomy Day will be celebrated locally on May 5 with an exhibit at the Science Museum and perhaps some evening observing in one of the parks. Mike Kibat is organizing the activities. Please call him at 883-0039 if you can bring an exhibit or even just come and talk to the people who stop by.

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The MAS regularly gets calls from schools who are looking for someone to come in and give a special presentation on astronomy. We need to keep the pool of people who do this up-to-date and enlarge it if possible. If would like to do this sort of thing,

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please call Max Radloff and tell him you are interested.

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The MAS has received an invitation to tour the University of Minnesota's physics facility in the Tower-Soudan mine. Since the tour must be on a weekday, we will do it sometime this summer possibly on July 27, the date of our northern star party.

We are thinking of a day-long field trip, with the regular tour of the mine in the morning and the tour of the physics experiments in the afternoon. Other points of interest could be included.

If you have any ideas or suggestions, please call Lauren Nelson, 644-1254, or Max Radloff.

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We regularly get questions about membership renewal. The MAS does not sent out renewal notices. About three or four months before your membership expires, you will receive a card from *Sky & Telescope* informing you that your subscription is about to expire. To renew your membership, return this card along with your dues to our treasurer, Richard Nelson. *Sky & Telescope* will send a second notice, but by that time it will be difficult to avoid delays in getting your subscription renewed.

## CELESTIAL PC

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Installation procedures are automated with a .BAT file for MS-DOS users. Several text files contain additional instructions for either installation or use. They appear adequate for the more than casual computer user to handle. Once the installation process is undertaken, have a couple of blank disks available; unless you're blessed with a lot of free disk space, you may need to temporarily shuffle files off your hard drive to make room for the intermediate results of some of the install steps. Once the install is completed, some of the original and intermediate files can be deleted to recover some of the hard disk space.

For users of the MS-DOS operating system, a database report generator program is available--SACREP.EXE. It will build and index a dBase III format database, then provide a number of selection, reporting, inquiry and maintenance options.

The selection option allows you to build smaller databases by extracting objects for a specific constellation, a range of coordinates or a range of magnitudes. A specific object type (i.e., planetary, globular, etc.) may also be entered.

The report option also provides output to either printer or disk. Three different report formats may be selected depending on width of the printer carriage.

Information on a single object may be retrieved via the inquiry function.

Finally, SACREP.EXE provides database maintenance functions including creation of the initial data base from the text file supplied and combining extracted databases.

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## CELESTIAL PC

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The SAC 5.0 database will probably be of little value to the casual observer; however, intermediate and advanced users will probably find it useful. By automating the selection process, planning for observing or photo sessions can be greatly simplified. For example, by specifying magnitude ranges an observing list can be produced which will allow for prevailing sky conditions and scope size. Observing lists based on a specific set of coordinates or for a given constellation can be used to generate a personalized "tour" of the night sky. The cross-reference to Uranometria 2000.0 and Sky Atlas 2000.0 are extremely helpful.

The database is freely distributed to anyone wishing to use it privately. It is not to be sold. It is available for download from a number of bulletin board services, including CompuServe. In fact, one of the contributors to the database, Dan Ward, is a regular participant on the AstroForum.

The developers of the SAC 5.0 database are to be commended. They have produced a result of almost epic proportions, purely for the love of their avocation, amateur astronomy. They stand to make no profit on their efforts, but thanks to their willingness to share the fruits of their labors freely, the rest of us stand to profit much!

EDITOR'S NOTE: The database described by Kibat in the preceding article is not the "Arizona database" available through MAS. Each was produced by a separate efforts after a division among the members of the Arizona group that started the project. See the article "Examining the Arizona Database" in this edition.

## DEEP SKY EYE

By Max Radloff

The winter Milky Way is now gradually sliding lower in the west. Before it disappears for the summer months, you can view three open clusters on its eastern side.

The biggest and brightest of these is M 44, also known as "Praeserpe" or "The Beehive". Like many extended objects, it can be used as a quick test of sky transparency. It varies from invisible in light polluted skies to a bright, vivid little star cloud in the darkest skies.

Because it is so large, I suspect that many amateurs don't really observe this cluster. Even though it more than fills the field of any scope 6 inches or larger, it is still worth examining. Most of the brightest stars are white but there are half a dozen yellow giants among them. Picking these out is a good way to train your eye to notice color differences. You can also get a rough idea of how many faint stars belong to the cluster by seeing how many you can see at the cluster center, at the cluster edge, and then in a field a degree or so away. Walter Scott Houston featured this cluster in his March column in *Sky & Telescope*.

To the west of Alpha Cancris is the second Messier cluster in Cancer, M 67. This is smaller, fainter, and more distant. It is easy to resolve in a small telescope and the view improves dramatically in dark skies.

It has a stellar makeup similar to M 44. Most of the brightest stars are white but with some yellow giants mixed in. Because the brightest stars in M 67 are about three magnitudes fainter than those in M 44, you will need more aperture to see the color.

The third cluster is also a Messier object, M 48 in Hydra. For many years this object was considered lost because Messier entered the position incorrectly in his catalog. It was later noticed that there was a cluster matching Messier's description at the same right ascension, but at a different declination.

There is no doubt that this is the cluster Messier saw and that he made a error when recording its declination. At magnitude 5.7, M 48 should be visible to the naked eye in dark skies but its low altitude may make this difficult from Minnesota.

M 48 is closer to us than M 67; consequently it is larger and brighter. It too is composed of primarily white stars with three yellow giants. The three brightest stars are in a line in the center of the cluster.

Good luck and clear skies.

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## SEEING DOUBLE

By Bob Liesenfeld

In this month's edition we will take a look at some of the techniques associated with the observing of double stars.

Doubles can be a very rewarding facet of your observing program and with some simple equipment meaningful measurements can be made.

The observing of double stars involves techniques that may be

unfamiliar to many observers but with a little practice they become second nature. One of the first things that must be learned is the true field that each of your eyepieces gives with your telescope.

star to drift over to the other edge of the field. This should be repeated several times, and the average value recorded. The true field can be found from the following expression. True field in minutes of arc = time in minutes X 15. This should be done for all your eyepieces. It will be very

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This should not be confused with the "apparent field" of an eyepiece, which is a fixed quantity for a given eyepiece, whereas the true field depends on the telescope it is used with.

One of the simplest ways to determine the true field of an eyepiece/telescope combination is to place a star on or near the celestial equator at one edge of the field, turnoff any clock drive, and time how long it takes for the

## SEEING DOUBLE

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helpful to know the true field when looking for faint pairs, judging separation, etc.

Next, you need to be able to identify directions in the field. To do this, turn off the drive and watch how stars drift through the field. They will move from east to west. See Figure 1. The next direction to be found is north, and of course it will be on a line at 90 degrees to the east-west line but which way, "up" or "down"?

A very simple way to find north is to nudge the tube slightly towards Polaris while observing the field in the eyepiece. Notice how stars appear to move to one side of the field. This side of the field is south, so 180 degrees away is north, as is shown in Figure 2. While this may seem complicated, it becomes very easy with just a bit of practice.

The next bit of double star nomenclature we need to define is the term "position" angle or P.A. This is where knowing the directions in the field of view comes into play. The classic way to describe a double is by labeling the brighter of the pair the "A" component and the fainter "B". Then the angle from north through A to B is the position angle of the pair. North is taken as 0 degrees, east is 90, south 180 and west 270 degrees. In Figure 3, the position angle is approximately 45 degrees. Next, the separation of the pair can be estimated from your knowledge of the diameter of the field of view of the eyepiece in use, the example in Figure 4 being about two arc minutes.

You are now ready to start making visual estimates of pairs! It's a lot of fun to simply look up the position of some wide doubles in a list such as Webb's or Sky Catalog 2000 Vol \$2 and finding them on a chart such as Norton's or Sky Atlas 2000. Then, using star hopping or setting circles finding them on the sky.

This by the way is an excellent way to learn your way around the sky. You will find that at first, it will be tough to find even fairly bright stars on the sky from your chart, but after some practice it's a snap. I have no circles on my alt-azimuth mount and have yet to be stumped when looking for an object.

Next time we will take a look at some of the finer points of double star observing such as some simple micrometers for making quantitative measurements and what you can expect from your scope when trying to split close pairs.

## THE VOICE IN THE WILDERNESS

By Harold Doweiko

In the last issue of Gemini, I wrote at length about Comet Austin. As the comet draws ever closer to the sun, astronomers the world over are starting to wonder if the comet will live up to predictions.

At this point in time (mid-March) it is hoped that Comet Austin will be a magnitude 1 or 2 object in the predawn sky. Earlier predictions had placed Comet Austin at magnitude 0, or even -1 but in the past few weeks the comet has not brightened as much as predicted.

Further, the comet has failed to develop a distinct coma. In the past, a bright, distinct coma has been associated with bright comet while an indistinct coma has been found to go along with less impressive comets.

Comet Austin's failure to develop a distinct coma suggests that it will not live up to earlier predictions, although it should still be a naked eye

object well worth the trouble to view.

About the only prediction that can be made at this time is that Comet Austin might, or might not, live up to predictions as to its brightness.

Using the coordinates for the Twin Cities area, I have provided a computer-generated map showing the approximate location of Comet Austin for the moonless viewing period around April 25. The map is of that portion of the sky seen when looking northeast in the predawn sky. April 25 is an especially good viewing date because the moon will be new and will not be in the sky when the comet is visible for the next eight days.

Remember that sunrise on April 25 is at 5:13 a.m. local time. Dawn will begin about 75 minutes before that and you will need between 20-30 minutes for your eyes to adapt to the dark before you try to view the comet.

Thus, you should plan on arriving at your observation site at around 2 a.m. to give yourself a chance to get your equipment up and become adapted to the dark prior to the comet's appearance.

The coordinates of the comet for 0 hours UT on April 25 are R.A. 0h 36', Dec. +36°. This will be slightly south of M 31 and the comet should be about 19° above the horizon when morning twilight begins. All things being equal, this should be a comet well worth the effort to see.

II.

Moving on, in the last issue of Gemini there was a notice that the Science Museum of Minnesota is planning a field trip to Baja, Mexico, for the total solar eclipse of July 9, 1991. This eclipse will last for approximately seven minutes and will provide an excellent opportunity for photographs, if the weather cooperates. I have already reserve my place and hope that other interested parties reserve their places soon.

I would like to see this column become a clearinghouse for ideas, plans and information on the eclipse trip. Jay Anderson, in the February 1989 issue of *Astronomy*, called this eclipse the "best one of all" between now and the year 2000. While nobody can guarantee perfect weather, Baja should be a pretty good bet for clear skies and good observing, according to Jay.

Since this is my first total solar eclipse, I will do a lot of research before I leave. Joel Harris wrote

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## VOICE IN THE WILDERNESS

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an article in the January 1988 issue of *Astronomy* in which he discussed his passion for eclipses. In that article, he offers neat tips for viewing and for photographing a total eclipse of the sun. These tips could be a lifesaver for anyone who attempts to photograph the eclipse.

James Muirden offers some interesting

*The Amateur Astronomers Hand*

*book*. He observes, for example, that the appearance of Baily's Beads is impossible to predict in advance because of variations in the moon's silhouette from eclipse to eclipse. He also prints out that the solar corona tends to be larger and more uniform when the eclipse takes place near the solar maximum.

It promises to be an exciting time. Hope to see you there!

## EXAMINING THE ARIZONA DATABASE

By Carl Harstad

An article by Mike Kibat in this edition examines a database from Arizona but not the "Arizona database" MAS offers its members for \$7. (See Announcements for more information on obtaining this software.)

According to Kibat, the two similar but not identical databases from Arizona are the result of a rift in the original group working on the project.

This article examines the "Arizona database" offered by MAS. Readers may find it interesting to compare it to the database described in Kibat's article. Hereafter in this article, "Arizona database" observations on observing and photographing a solar eclipse in his book

refers to the one offered through MAS.

The archived database fits on two 360 KB 5 1/4-inch floppy diskettes (IBM format) but expands to 4,381,402 bytes, making a hard drive (with a lot of spare room on it) essential. There are also some companion files, including a boot screen, installation documentation and a ZIP file containing the database documentation. The database documentation file explodes to 45,673 bytes.

The file is a dBase III Plus file containing 16,346 records, including one header record, leaving 16,345 objects. The majority of the objects--10,177 of them--are galaxies. The remainder are primarily open clusters, globular clusters, bright nebula, planetary nebula, diffuse nebula, double stars and quite a number of "type unknown" or "unknown/unverified" objects.

The structure of the database is:

**EXAMINING THE ARIZONA DATABASE**

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<u>Field</u>	<u>Description</u>	<u>Field width</u>
1	Object	17
2	Also known as	26
3	Type	20
4	Constellation	5
5	R.A. hours           2	
6	R.A. minutes	4
7	Declination degrees 3	
8	Declination minutes 2	
9	Catalog magnitude 6	
10	Catalog size	11
11	Class type           10	
12	Uranometra	16
13	Sky Atlas 2000 (Tirion)	12
14	Description	50
15	Surface brightness 4	
16	Distance (LY X 1000)	5
17	Number of stars   4	
18	Brightest star	5
19	Notes	60
20	Source	5

Total record length           260

Note the similarities and differences between this "Arizona database" and the one described in

Kibat's article.

Those readers familiar with dBase will know that the database can be sorted on any field or combination of fields (or parts thereof), can be printed using any selection criteria, etc. This gives the user the flexibility to select objects based on whatever criteria he or she desires. Kibat's comments on this

subject are true for this version of the Arizona database also.

The version of the Arizona database described here (version 5.0) is offered by Bob Erdmann, c/o The Arizona Database Project, 971 E. Driftwood Dr., Tempe, AZ 85283. Telephone: (602) 897-1169.

According to information received by Kibat from the Saguaro Astronomy Club, the club hopes for an eventual reconciliation with Erdmann and a resumption of their joint effort. Apparently Erdmann is concentrating on adding more objects whereas the club is concentrating on perfecting the existing data and keeping the database format the same.

### MEMBERSHIP AND SUBSCRIPTION FEES

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