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12 May 1980

Dr. John J. Palimaka
Dr. Alan H. Bridle
Dept. of Physics, Stirling Hall
Queen's University
Kingston, Canada K7L 3N6

re: your letter of 28 April

Dear Sirs:

Permission is herewith granted to reproduce Sky Atlas prints or sections thereof, as noted in your recent letter, for illustrations in your forthcoming publication.

Acknowledgment of these copyrighted prints should accompany your reproduction as follows: "Copyright by the National Geographic Society - Palomar Observatory Sky Survey. Reproduced by permission from the Hale Observatories."

If we can be of assistance in the future, please write again.

Yours sincerely,

R. Goodwin

Rhea Goodwin (Mrs)
Photo Permissions Department

THE ASTRONOMICAL JOURNAL | COLUMBIA UNIVERSITY
PUPIN BUILDING | NEW YORK 10027

24 April 1980

Dr. J.J. Palimaka
Department of Physics
Stirling Hall
Queen's University at Kingston
Ontario, Canada K7L 3N6

Dear Dr. Palimaka:

Your paper, "Extended Radio Sources and Elliptical Galaxies V. Optical Positions for 40 Identified Sources" has been accepted. The referee made the following suggestion:

> "The authors may wish to refer to Schilizzi 1975 (Mem.R.astr.Soc. 79, 75) for an earlier optical position for 0325+023, rather than continue with their present reference to Wyndham (1966)."

If you wish to make any changes, please send us a note and we will do it for you. Or you can do it in the proof stage of your paper.

The publication date of this paper has not been scheduled at this point. We are holding onto it for acceptance of paper IV. We will notify you later on the scheduled publication date.

Sincerely,

Susan Mescher

Susan Mescher
Assistant Editor

DEPARTMENT OF PHYSICS
STIRLING HALL
Physics
Engineering Physics
Astronomy

Queen's University
Kingston, Canada
K7L 3N6

Dr. W.C. Miller,
Photographic Research Lab,
Hale Observatories,
813 Santa Barbara St.,
Pasadena, CA 91101

April 28, 1980.

Dear Dr. Miller,

We request permission to reproduce portions of the following prints of the Palomar Sky Atlas in a paper that we have submitted for publication in the Astronomical Journal:

O-21
O-1320
E-225
E-1350
E-745
O-924

Yours sincerely,

John Palimaka

J.J. Palimaka

A.H. Bridle

THE ASTRONOMICAL JOURNAL | COLUMBIA UNIVERSITY
PUPIN BUILDING | NEW YORK 10027

Telephone: (212) 280-3875

26 March 1980

Dr. J.J. Palimaka
Department of Physics
Queen's University
Kingston, Canada
K7L 3N6

Dear Dr. Palimaka:

The manuscript, "Extended Radio Sources and Elliptical Galaxies V. Optical Positions for 40 Identified Sources" has been received and will receive prompt attention.

Enclosed is a copy of the American Astronomical Society "Transfer of Copyright Agreement". *This form must be completed and received by our office before the manuscript can be accepted for publication.*

We hope that the editorial, "Contribute Your Copyright", which is printed on the back of the copyright form, will answer any questions you may have regarding the copyright transfer for your manuscript. In brief, under the new (1978) U.S. copyright law, copyright transfer is no longer assumed to be implicit in the act of submitting a manuscript for publication, but now requires a formal, written transfer. We would like to call to your attention the next to last paragraph of the editorial, which explains that authors retain all traditional rights under the new law.

Sincerely,

THE EDITORS

DEPARTMENT OF PHYSICS
STIRLING HALL
Physics
Engineering Physics
Astronomy

Queen's University
Kingston, Canada
K7L 3N6

The Editors,
Astronomical Journal,
Dept. of Astronomy,
Columbia University,
538 West 120 Street,
New York, NY 10027

March 21, 1980.

Gentlemen,

We enclose two copies of a manuscript entitled 'Extended Radio Sources and Elliptical Galaxies V. Optical Positions for 40 Identified Sources' by J.J. Palimaka, A.H. Bridle and E.B. Fomalont, which we hope will be suitable for publication in the Astronomical Journal. Also enclosed are photographs and original copies of Tables I and II and photographs of Figures 1 and 2. We request that the notes and references following the tables be typeset rather than photographed as we do not feel that they are of camera-ready quality.

If this paper is accepted for publication, we would like it to appear in the same issue as our recently submitted manuscript 'Extended Radio Sources and Elliptical Galaxies IV. Structures of 40 Resolved Sources', by E.B. Fomalont, J.J. Palimaka and A.H. Bridle.

Please address all correspondence regarding this paper to J.J. Palimaka, Dept. of Physics, Stirling Hall, Queen's University at Kingston, Ontario, Canada K7L 3N6.

Sincerely yours,

John Palimaka
J.J. Palimaka

A.H. Bridle

1a) Radio - Opt posn > combined errors (accounting for rounding)

0238+085 - X-Band small component position x galaxy position
extended core ~4"

~~0734+806 - core may be as large as 2"~~

0800+247 - ~3" offset may be within errors since 5GHz beam ~ 16"x8", no errors quoted for core position by Fanti et al (1977)

0858+292 - core confused by [redacted] LSS ~1".5

~~0922+366 - core may be as large as 1"~~

1130-037 - poor u-v coverage error in core position difficult to estimate

~~1250+102 - extended core ~3", 20"x14" galaxy~~

1414+110 - large galaxy size 24"x20"

1440+504 - core may be [redacted] as large as [redacted] 1"

2117+605 - core may be as large as 1"

Radio - Opt posn DRA/DDEC ≥ 1".5

0238+085 - X-Band core position on ID [redacted]

0800+247 < 0858+292 OK

1130-037

~~structures not clearly bifurcated~~

Probability of finding core within search area by chance ≥1%

0734+806 3~~8~~%

0922+366 1%

1154-038 4%

1422+26803 ~~2~~%

OK on the basis of realistic a more ~~conservative~~ search area

~~OK all centroid-optical offsets < 1".5 LAS all bifurcated structures~~

2. Papers IV Sources not satisfying criteria for identification on the basis of coincidence with small components

	mag ID	mag E	mag O	
0055+265	13.4	~20		✓
	13.9	~20		
0059+144	17.1	~20		✓
	19.2	~20		
0108-142	13.8	~20		✓
	13.9	~20		
0110+152	14.1		16.1	
	15.4		17.0	
0124+189	14.1	~20		✓
	14.6	~20		
0153+053	12.0	~20		✓
	12.5	~20		
0602+477	17.6	P(20)/P1 < 10		
	20.0			
~~* 0734+806~~	~~17.0~~		~~16.9~~	
	~~17.3~~		~~17.8~~	
* 0800+247	14.6	18.7		✓
	14.9	18.9		
0838+325	10" galaxy	11" source	3.1" offset	
* 0858+292	17.5	P(20)/P1 ~ 10		
	18.6			
0932+253	16.9	~20		✓
	17.3	~20		
1033+003	14.4	18.8	15.9	
	15.9	~20	17.0	
1127+012	16.1	~20		✓
	17.2	~20		
* 1130-037	14.0	16.9	SO?	✓
	14.6	17.0		

1137+123	14.5	~20	17.0	✓
	15.1	~20	18.1	
1150+227	17.1	~20	✓	
	19.5	~20.		
1247+503	17.6	P(20)/P1 < 10		
	19.5			
1256+282	13.9	15.2	~~S0?~~	16.8 ✓
	13.8	15.4		M.0
1303+366	18.7	P(20)/P1 < 10		
	19.3			
1435+038	16.9	P(20)/P1 < 10		
	19.5			
1443+178	14.5	~~15.6~~	17.7	✓
	15.3	~~17.9~~	17.7	
1710+156	7" galaxy	7" source	1.2" offset	
1726+318	16.8	17.3		
	16.6	18.7		
2354+471	13.5	17.4	✓	
	14.7	19.0		

— taken from thesis ~~computer~~ work

1407+177	12.2	14.2
	12.7	14.7

3. a) sources with other objects in structure which are within ~2" of proposed ID

	Rad-Opt offset	Structure type	
0110+152 db	2.8%	D	
~~0734+806~~	~~11%~~	~~I~~	
1033+003			
~~1055+018~~	14%	D	formally satisfies reliability criteria
1726+318	1.3%	D	

b) sources which may be ~~identified~~ associated with objects below the plate limit

0602+477	1.8%	D
0858+292	mean opt on adjacent prints ~ core posn	C(H?)
1247+503	4.1%	E(D)
1303+366	2.3%	D
1435+038	5.6%	D

Optical and radio cmpt disagree, but optical is near centroid of radio LSS.

Paper V

TABLE I. Optical positions of radio galaxy centers.

Radio structure	Name	R.A. (1950)	Dec (1950)	Plate	m	Size	Type (offset)	Refs	Notes
D	0055+265 PK0055+26	00 55 40.71 0.03	+26 35 44.7 0.4	O	13.7	22x14	C(10.1)	Fan77 Col75	
D	0059+144 3C30	00 59 27.46 0.02	+14 27 18.8 0.4	O	17.2	4x3	C(11.2)	unpub Mer69	
D	0108-142 PK0108-142	01 08 40.30 0.10	-14 13 35.8 0.4	O	13.9	13x13	C(8.5)	Fom80 Bol67	
D	0110+152 4CT15.03.1	01 10 20.20 0.02	+15 13 35.3 0.3	O	14.8	9x7	C(2.8)	unpub Mer72	
D	0124+189 PK0124+18	01 24 12.24 0.02	+18 57 19.1 0.4	O	14.4	12x11	C(2.1)	Fom80 Sha78	
D	0153+053 PK0153+05	01 53 44.31 0.04	+05 23 05.4 0.4	O	12.3	30x25	C(5.1)	Fom80 Pal80	
T	0238+085 PK0238+08	02 38 25.85 0.02	+08 31 29.0 0.4	O	13.9	13x11	S(3.2)	Fom80 Pal80	
T	0305+039 3CR78	03 05 49.08 0.04	+03 55 13.2 0.6	O	13.8	14x12	S(0.3)	Fom80 Mal63	
D	0325+023 0602+477 WK124	06 02 35.05 0.03	+47 47 55.2 0.6	E	18.8	5x3	C(1.8)	Fom80 Pal80	
H?	0704+351 OI307	07 04 24.40 0.02	+35 08 23.6 0.4	O	15.4	7x6	S(0.5)	unpub Rud77	
T	0734+806 3CR184.1	07 34 25.05 0.08	+80 33 24.1 0.4	O	17.2	5x4	S(0.5)	Ril75 Wyn66	
H?	0800+247 B20800+24	08 00 16.24 0.02	+24 49 03.9 0.4	E	14.8	14x10	S(3.0)	Fan77 Col75	
D	0838+325 B20838+32A	08 38 06.75 0.04	+32 35 43.7 0.4	O	14.9	10x9	C(28.9)	unpub Pal80	
C	0858+292 3CR213.1	08 58 05.11 0.05	+29 13 34.3 0.5	O	18.1	4x3	S(2.0)	unpub Wyn66	
T	0922+366 B20922+36B	09 22 34.20 0.04	+36 40 04.6 0.4	E	15.6	10x9	S(0.4)	Rud79 Rud79	
E	0932+253 B20932+25	09 32 40.07 0.03	+25 24 09.5 0.4	E	17.1	5x4	C(20.8)	unpub Ols70	
C(T)	1005+007 PK1005+007	10 05 37.34 0.03	+00 44 42.0 0.7	O	15.4	7x6	S(0.5)	Fom80 Mer70	
D	1033+003 PK1033+003	10 33 31.93 0.04	+00 21 41.1 0.4	O	15.2	8x6	C(14.4)	Fom80 Mer70	
D	1127+012 PK1127+012	11 27 47.51 0.02	+01 14 56.6 0.4	O	16.7	5x4	C(13.4)	Fom80 Mer70	
C?	1130-037 PK1130-037	11 30 31.85 0.02	-03 44 14.3 0.5	O	14.3	10x8	S(3.2)	unpub Mer70	

TABLE I. Optical positions of radio galaxy centers. (Continued)

	Name	R.A. (1950)	Dec (1950)	Plate	m	Size	Type (offset)	Refs	Notes
D	1137+123 PK1137+12	11 37 52.64 0.02	+12 19 46.0 0.4	O	14.8	9x7	C(6.0)	Fom80 Cla66	
D	1150+227 4C22.32	11 50 34.50 0.05	+22 45 54.2 0.4	E	17.3	5x4	C(22.7)	unpub Ols70	
T	1154-038 PK1154-038	11 54 14.73 0.02	-03 48 58.9 1.1	O	14.3	12x10	S(0.8)	Fom80 Mer70	
E(D)	1247+503 WK301	12 47 01.68 0.04	+50 21 09.0 0.4	E	18.6	4x4	C(4.1)	Fom80 Pal80	
T	1250-102 PK1250-10	12 50 30.64 0.02	-10 13 21.5 1.5	O	13.4	20x19	S(1.3)	Fom80 Mer69	
H	1256+282 5C4.81	12 56 58.52 0.04	+28 10 51.1 0.4	O	13.9	15x15	C(18.3)	Owe77 Col75	
D	1303+366 B21303+36B	13 03 31.83 0.02	+36 38 56.1 0.4	E	19.0	4x3	C(2.3)	Fom80 Kat78	
T	1414+110 3CR296	14 14 26.37 0.03	+11 02 19.3 0.4	O	12.5	24x20	S(0.7)	Fom80 Wyn66	
T	1422+268 PK1422+26	14 22 26.50 0.03	+26 51 01.8 0.4	O	13.9	11x10	S(0.5)	Fom80 Col75	
D	1435+038 PK1435+038	14 35 50.86 0.02	+03 53 09.6 0.4	E	18.2	6x5	C(5.6)	unpub Mer70	
D?	1443+178 4C17.6	14 43 38.10 0.02	+17 51 02.7 0.4	O	14.9	9x7	C(13.8)	unpub Wil69	
T	1514+004 PK1514+00	15 14 06.73 0.02	+00 26 01.5 0.4	O	14.8	10x8	S(0.5)	Fom80 Bol68	
E	1710+156 1710+156	17 10 11.52 0.02	+15 39 39.2 0.4	E	16.7	7x4	C(17.6)	Fom80 Hos72	
D	1726+318 3CR357	17 26 27.31 0.02	+31 48 24.6 0.6	O	16.7	6x5	C(1.3)	unpub Gru72	
C(T)	1940+504 3CR402S	19 40 25.57 0.05	+50 28 38.2 0.4	O	13.5	17x15	S(0.8)	Bri78 Lon75	
T	2103+124 PK2103+12	21 03 47.73 0.04	+12 27 52.1 0.9	O	16.2	5x5	S(0.5)	Fom80 Cla66	
T	2117+605 3CR430	21 17 02.73 0.03	+60 35 27.1 0.4	O	16.9	3x3	S(0.7)	Ril75 Wyn66	
E	2342+294 E22342+29	23 42 33.04 0.02	+29 26 05.5 0.3	O	17.3	5x4	C(32.9) S(0.7)	unpub Ols70	
D	2354+471 DA613	23 54 57.50 0.06	+47 09 39.8 0.3	O	14.1	12x11	C(3.0)	Fom80 Ver71	

1	+0.5		
2	+0.1		
3	+0.1		
4	+1.3		
5	+0.5		
6	0.5		
7	0.2		
8	0.6		
9	1.2		
10	1.9 (2.4)	0602+477	
11	2.0	0704+351 ✓	
12	0.3		
13	0.3		
14	0.7		
15	1.1		
16	1.5		
17	0.4		
18	1.2		
19	1.5		
20	1.1		
21	0.6		
22	0.6		
23	0.4		
24	0.7		
25	1.9		
26	0.8		
27	0.2 (-0.1)	1256+281	
28	0.6		
29	1.0		
30	1.0		
31	2.6	1435+038 ✓	
32	0.8		
33	0.8		
34	-0.2	1710+156 ✓	
35	1.9		
36	0.8		
37	0.9		
38	2.0	2117+605 ✓	
39	1.6		
40	1.2		

Offset %LAS	PAPER I	II	III	IV	V	TOTAL
0-5	15	3		3	1	22
5-10	10	1	2	7	1	21
10-15	5	2		1	1	9
15-20	1	2				3
20-25	1					1

Notes to Table I - PAPER V

1 0055+265

Guthrie (1979) ~~and the Uppsala General Catalogue~~ calls this a db but this is not particularly ~~can~~ evident by inspection of the print copy of the PSA/ 1005+007, 1033+003, 1130-037, ~~1130-037~~ 0602+477, 0704+351, 0734+806, 0838+325, 0922+366

2. 0108-142, 0110+152, 0124+189, 0153+053, 0238+085
~~All~~ optical object
Another ~~galaxy~~ lies in or near the radio structure, see Table II.

3. 0110+152
Optical position is the mean of 2 measurements

4. 0110+152
Optical position ~~is obtained from the mean of the positions of the two nuclei of the~~ is for the brighter nucleus of a db ~~galaxy~~ system, see Table II for the position of the other nucleus.

5. 0238+085
~~The~~ core is extended ~4 arcsec diameter. Clarke et al (1966) call this a db galaxy see Table II for position of companion.

6. 0305+039
Optical position also given by Griffin (1983)

7. 0704+351
Optical position also given by Rudnick & Owen (1977)

~~8.~~ 0704+351

Rudnick and Owen suggest that there are 2 H-T sources in ~~the~~ field. Position given is for ~~the~~ obj 1 and their finding chart. Their small component position in ~~X~~8.1 GHz

0704 24.41±0.02, 35 0823.7±0.3, position of ID for the other H-T given in ~~Table~~ II

~~9. 0800+247~~

~~Identification is with Nathan's Radio structure in the field shown in Fanti et al (1977). see text. See. III?~~

~~10. 0838+325~~

~~The source or centroid with size comparable to that of the galaxy see text Sec III.~~

~~8.~~ 0858+292

Optical position also given by Wills et al. (1973).

~~9.~~ 10. 0922+366

Optical position also given by Rudnick and Adams (1979) and Fanti et al (1978). ID is obj 2 on ~~their~~ finding chart the Rudnick/Adams

10. 1033+003

The source contains a central component extended ~~source~~ source is apparently resolved into 2 components at X-Band one of which is ~1.3 arcsec from the opt. pos. (see paper IV (note to table I?)

12. 1249+503

A 15±7 mJy core is seen at 8.1 GHz at $12^h\,47^m\,1.65 \pm 0.05$, $+50\ 21\ 11.8 \pm 1.4$ which is not separable from the larger scale emission at 2.7 GHz. (see paper IV) not to table I)

12. 1256+282

opt position is the mean of 3 measurement by different observers.

13. 1303+366

O-print image suggest position may be for the center of a db system.

The finding chart marked 1303+36W3 ID is as in Kalgut (1978).

14. 1414+110

Opt. posn also given by Veron (1966)

16. 1422+268

Fanti et al (1977) find a 20 mJy small compact at 5 GHz at 14 22 26.5 26 51 00 which considering their 7.6 X 16.9" beams size is consistent with the opt. pos. The small compact posn given in paper IV. Table II

16. 1435+038
The identification is very red ~~and~~ and possibly has multiple nuclei.

17. 1514+004
The source was misidentified with as a QSO By Bolton & Kinman (1966) and Clarke et al (1966).

18. 1910+156
Opt. posn also given by Hoskin et al (1972). The ID is of neutral galaxy, slightly diffuse and elongated.

19. Opt 1726+318
Opt posn also given by Ledrich & Adam (1974) Paper II gives 3mb upper limit to any stellar-diameter opt at galaxy position. See Table II for positions of other objects marked on chart by Ledrich/Adam.

20. 1940+504
The ID is the southern galaxy marked with cross-hairs on the finding by Longair & Gunn (1975). The position of the galaxy is usually identified with the entire source 3C402 is given in table II. See paper IV for a map of the part of the source identified with the galaxy whose posn is given in Table I.

2342+244

at 5 GHz

21. The source has been observed at the VLA and is ~2 arcsec in angular diameter but the morphology is uncertain. Hazard et al (1970) call this D a spiral with a blue nucleus however it appears to us ~~to be of normal elliptical~~ not to be particularly abnormal.

Table II – PAPER V

0108-142 01 08 42.63 ± 0.1, -14 14 21.7 ± 0.4) 16.^m5
gal to SE of following lobe, outside structure

0110+152 01 10 20.77 ± 0.02, 15 13 38.2 ± 0.3 15.^m5
other nucleus of db
01 10 20.03 ± 0.02, 15 13 47.8 ± 0.3 18.^m5
01 10 20.88 ± 0.02, 15 13 28.8 ± 0.3 17.^m5
other faint image near db galaxy

0124+189 01 24 12.50 ± 0.2, 18 57 2.3 ± 0.4 19.^m0
faint diffuse linear feature near ID

0153+053 01 53 47.30 ± 0.04, 05 22 57.8 ± 0.4 15.^m0
galaxy just to E of following lobe

0238+085 02 38 26.92 ± 0.02, 08 31 39.1 ± 0.4
~~companion~~ other nucleus of db? 15.^m0
02 38 22.74 ± 0.02, 08 32 1.1 ± 0.4
02 38 32.57 ± 0.02, 08 30 22.0 ± 0.4 15.^m0
galaxy on edge of emission bridge
galaxy to NE of SF component 14.^m0

0602+477 06 02 33.35 ± 0.03, 47 47 47.4 ± 0.6
gal to W of Sp lobe 19.^m0
06 02 35.95 ± 0.03, 47 47 35.9 ± 0.6
gal to SE of Sp lobe 18.^m5

0704+351 07 04 21.94 ± 0.02, 35 08 23.6 ± 0.4
gal in preceding structure, other H-T? 15.^m5
07 04 22.89 ± 0.02, 35 08 16.3 ± 0.4
gal in Sp structure 15.^m0

Table II (Continued)

0734+806 07 34 29.00±0.07, 80 32 26.8±0.1 17.5
gal in Southern radio structure

0838+325 08 38 06.41±0.04, 32 35 38.56±0.4
other nucleus of db? 16.0
08 38 07.24±0.04, 32 35 33.38±0.4 16.5
08 38 07.77±0.04, 32 35 22.06±0.4 17.0
other faint image mem ID

0922+366 09 22 34.07±0.02, 36 39 31.1±0.4
companion galaxy 18.0

1005+007 10 05 34.69±0.03, 00 45 0.5±0.7
gal? to NW of radio structure 16.0

1033+003 10 33 28.4±0.04, 00 21 47.4±0.4
gal to W, 1 within ~~Sp~~ radio ~~lobe~~ 16.5
of ID probably structure

1130-037 11 30 32.34±0.02, -3 44 24.3±0.5
gal? companion 17.5
11 30 33.44±0.02, -3 44 11.7±0.5 gal? ~~compan~~ 18.0

1137+123 11 37 51.88±0.02, 12 18 56.0±0.4
gal ~~two~~ in south radio structure 17.5
11 37 55.85±0.02, 12 19 29.3±0.4
gal to E of source. 16.5

1150+227 11 50 33.63±0.05, 22 46 12.0±0.4 17.0
stellar? obj to N of preceding lobe
11 50 36.63±0.05, 22 46 06.53±0.4 19.5
obj on E edge of radio structure

1154-038 11 54 09.35±0.02, -3 50 39.4±1.1
gal to SE of Np lobe 15.5

Table II (Continued)

1414+110 14 14 26.87 ±0.03, 11 01 45.8 ±0.4
companion galaxy Sad of ID $14^m.5$

1514+004 15 14 07.40 ±0.02 00 25 52.3 ±0.4 $19^m.0$
stellar? neighbor in radio structure

1726+318 stellar? 17 26 29.33 ±0.02, 31 48 11.8 ±0.6 18.0
gal? 17 26 28.13 ±0.02, 31 48 30.5 ±0.6 17.5
blue 17 26 25.49 ±0.02 31 48 27.5 ±0.6 $18^m.5$
other objects in ~~structure~~

1940+504 19 40 21.87 ±0.05, 50 30 49.4 ±0.4 $13^m.0$
bright galaxy in the ~~field~~ source 3C402
19 40 24.23 ±0.05, 50 30 08.0 ±0.4
gal to NW of radio ~~structure~~ in paper IV shown $14^m.5$

2117+605 21 17 0.09 ±0.03, 60 35 12.7 ±0.4
gal? in structure to NE of Sp component $18^m.0$
21 16 58.24 ±0.03, 60 35 07.9 ±0.4
gal outside radio struct. to NW of Sp cmpt.
$16^m.5$
21 17 0.69 ±0.03; 60 35 30.0 ±0.4
stellar? obj to W of source $16^m.3$

PAPER V

- check centroid - optical offsets for HT and CH sources - how do they fit in? ie are any of them bifurcated if you do not know where the galaxy is?

- how reliable are Allen's ~~gs~~ galaxy counts - are there any better numbers available?

~~- put ref to Allen in paper under criterion (b)~~

~~- make more precise criteria for ID when core coincides i.e. based on RLF?~~
~~or make reference to paper I~~

~~- check all refs, especially Allen (1973)~~

~~- check prob. of association calculations~~

~~- check all objects for unusual colors~~

~~- check refs~~

- look at distn of ID-centroid for core and non-core ID's