

RESOURCE SHARING AMONG ISRO LIBRARIES : A CASE STUDY OF CONSORTIA APPROACH

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Abstract: The paper presents a practical step by step approach and efforts made to achieve huge savings in acquisition expenditures and creative resources sharing among a group of libraries working under a single parent institution, namely, Indian Space Research Organisation (ISRO). Actual cases of substantial savings in subscription to costly journals, CD-ROM databases and conference volumes in the way of consortia price and/or combination (print and electronic) subscription prices are depicted with appropriate tables and charts.

Keywords: Resource sharing; ISRO libraries; Cooperative acquisition; Consortia approach; Journal subscription; CD-ROM databases.

1. Introduction:

The much talked resource sharing and library networking in Indian context often fails to reach the bottom/operational level to reap fruits in terms of increased service and/or decreased cost. The bottom-upward approach to resource sharing is rare. As such there are no practical efforts like that of even 'conspectus' of RLG (Sridhar, 1997). Not many sincere attempts are made to narrow the gap between idealistic theoretical slogans and the practical implementations (Sridhar, 1995). The latest addition to list of slogans is 'consortia approach'. It is not new to libraries as cooperative acquisition as a way collective decision making existed before. 'Consortia approach' to e-journals is a

<i>Year</i>	<i>No. of Titles</i>	<i>Amount (Rs in lakhs)</i>
1989	13	0.60
1990	62	4.00
1991	16	1.43
1992	86	14.27
1993	1	0.37
1998	25	11.85
2000	11	3.98
2001	18	7.81
2002	20	6.03
Total	252	50.34

marketing strategy of commercial publishers to get continuous longer commitment from a group of libraries for their journals. There has been a 'journal war' between scientists (authors) and commercial publishers who are working with as high a margin as 35% in spite of the fact that production cost of e-journals is very low as compared to print versions. Savings are estimated to be about 40-50% on distribution cost and 30% on paper cost in case of e-journals. Scientists (Public Library of Science) have pleaded for reduced prices for e-journals and free access to back issues of e-journals (after six months) and subsequently resorted to publishing competitive e-journals (The Economist, 2001).

Steep reduction in buying power of libraries, in the recent past, needs no overemphasis. Libraries have been combating the fiscal constraints mostly by canceling the costly and less used journals based on use studies and user opinion and try to depend on other libraries. Table 1 depicts the number and the cost (at the time of cancellation) of many costly journals cancelled by ISAC library over a decade or so (Sridhar, 1986, 1988). As could be seen from the table, as many as 252 costly journals worth over Rs. 50

lakhs were cancelled during last decade. Depending on content page services, exchanging with in-house publications, trying to obtain on gratis, etc., have already been substantially explored by most of libraries. However, like publishers of journals, libraries also need to have new strategies to face the unending fiscal constraints. An attempt is made here to present steps taken by ISRO libraries to work quietly and differently in this direction. This paper presents those decisions and follow-up actions taken as well as the implementation problems faced and the resultant benefits derived in the form of a case study.

YEAR	REGULAR PRICE	CONCESSIONAL PRICE	SAVINGS
AIAA CONFERENCE PAPERS			
2001	\$ 5500	\$ 2500	\$ 3000
AEROSPACE DATABASE ON CD-ROM			
1995	\$ 4890	\$ 3912	\$ 978
1996	\$ 4890	\$ 3912	\$ 978
INSPEC DATABASE ON CD-ROM			
1993	\$ 7500	\$ 3500	\$ 4000
1994	\$ 8100	\$ 3785	\$ 4315
1995	\$ 8100	\$ 3785	\$ 4315
1996	\$ 9095	\$ 4550	\$ 4545
1997	\$ 9550	\$ 4780	\$ 4770
TOTAL			\$ 26901

2. Genesis: Like other libraries in the country, there has been an informal but naturally marginal activity of inter library loan and other mutual help among ISRO libraries. Efforts were also put in to implement uniform library management software to enable remote networked access of holdings of about a dozen libraries within the organisation.

Taking advantage of changed pricing policies of publishers coupled with availability of new media like CD-

ROM, ISAC library could save about \$ 27,000 during last few years (Table 2). All these savings are achieved by making use of concessional prices extended for print subscribers and incidentally other sister organisations did have print subscriptions. The latest being \$ 3000 during 2001 on AIAA papers using order of VSSC for CD-ROM version. Having done so and with the encouragement and permission from the top management an effort is made during 2001 to develop a practical agenda (Table 3) for the entire group of libraries to increase savings on these accounts without any reduction in services to the customers.

3. Background Data:

Having assumed the responsibility, ISAC library circulated agenda among librarians of major centres during April/May 2001 seeking specific data about Journals, CD-ROM databases, package deals and standing orders. In the first phase, using ABC analysis, efforts were restricted only to costly journals (i.e, those costing >\$500), CD-ROM databases, package deals and standing orders (each costing >\$250). Relevant data was initially gathered from four major libraries. However, as the data was processed to seek consortia/ multiple copy / combination subscription prices (print and CD-ROM or online), a separate request letter was sent to other ten ISRO libraries and the data received from six of them (since remaining libraries did not have these costly acquisitions) was also appended to ensure that they are also included for the benefits of consortia/ multiple copy/ combination subscription prices.

<ul style="list-style-type: none"> • journal subscriptions (> \$ 500) • database subscriptions • other standing orders (> \$250)
<p>OPTIONS</p> <ul style="list-style-type: none"> • multiple copy subscription • combination subscription • sharing complimentary access to e-journals • membership subscriptions & package offers to the group • non-overlapping subscription to exceptionally priced standing orders
<p>REGULAR EXCHANGE OF DATA</p> <ul style="list-style-type: none"> • CD-ROM databases and print equivalents held/ subscribed • costly journals subscribed • complimentary INTERNET access to journals for sharing • categories of SRIM subscribed • exceptionally priced serials, package deals & standing orders

A quick look at the data so gathered (Table 4 and Chart 1) revealed that four major centre libraries (VSSC, SAC, ISAC and SHAR) put together but independently spend about Rs. 482 lakhs on acquisition of books, reports, journals, databases and other

TABLE 4 : ACQUISITION BUDGET OF FOUR MAJOR ISRO LIBRARIES

CENTRE	COSTLY JLS (>\$500)	OTHER JLS (<\$500)	OTHERS	TOTAL
ISAC	48	12	39	99
SAC	51	19	23	93
SHAR	8	12	20	40
VSSC	148	12	90	250
TOTAL	255	55	172	482

CHART 1 : BUDGET OF MAJOR ISRO LIBRARIES

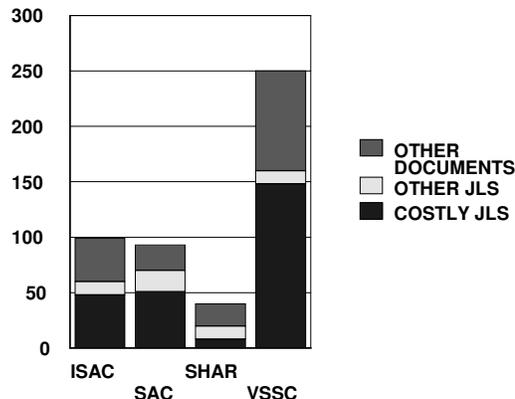


CHART 2 : COSTLY JOURNALS SUBSCRIBED BY ISRO LIBRARIES

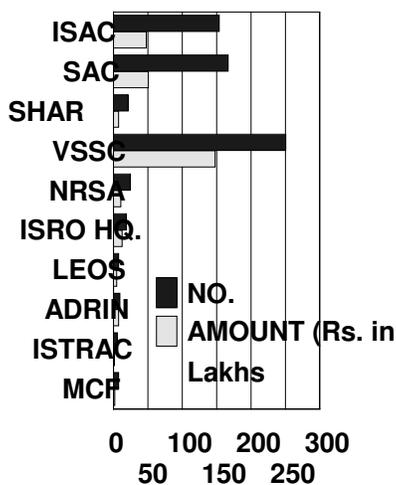


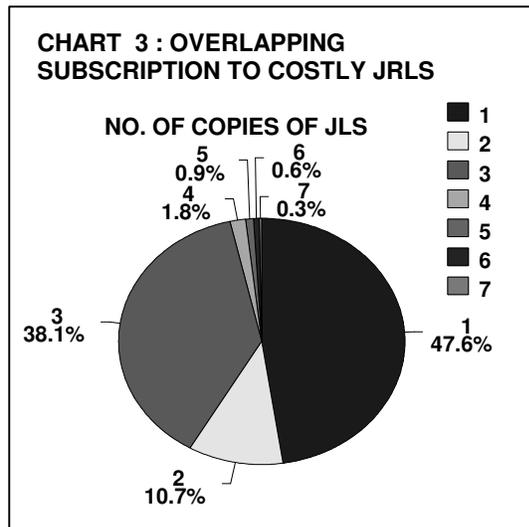
TABLE 5 : COSTLY JRLS SUBSCRIBED BY ISRO LIBRARIES

LIBRARY	NO. OF JLS >\$500	RS. IN LAKHS
ISAC	154	48.39
SAC	167	50.92
SHAR	22	8.13
VSSC	251	148.32
NRSA	25	11.34
ISRO HQ.	19	12.92
LEOS	8	5.23
ADRIN	10	8.09
ISTRAC	6	1.99
MCF	8	2.58
TOTAL	670	297.91

information material (Total budget of all libraries of ISRO is over 600 lakhs). Journals each costing over \$ 500 in four major libraries alone consume Rs. 255 lakhs. Further, Table 6 and Chart 3 depict that ten ISRO libraries put together spend about Rs. 300 lakhs on 386 unique titles of costly journals with overlapping subscriptions to the extent of 52% (Rs. 152 lakhs). In addition, the over lapping subscriptions to CD-ROM databases and costly standing orders like that of AIAA and IEEE conference volumes consumed another Rs. 70 lakhs.

TABLE 6 : OVERLAPPING SUBSCRIPTIONS TO COSTLY JOURNALS (Rs. In lakhs)

no. of copies	no. of jls	amount per subscription	total amount
1	160	145.98	145.98
2	36	26.65	53.31
3	128	23.14	69.43
4	6	4.81	19.26
5	3	1.03	5.17
6	2	0.53	3.21
7	1	0.25	1.81
total	336	202.39	298.17



4. Meeting of Librarians:

With the above data on hand, it was decided to have a meeting of four centre librarians to decide on (i) elimination of duplication and to share costly resources wherever possible, (ii) exchange of benefit of complementary/online access to journals to save on print subscription (iii) opt for combined subscription on consortia price or combination subscription price wherever available, and (iv) explore other ways of sharing costly resources. Accordingly a meeting held on 14.9.2001 took note of the fact that resource sharing and inter library cooperation has already been practiced by ISRO libraries among themselves as well as with other libraries in the respective cities/ region. In order to effectively face the budget crunch and increased prices of information materials and conversion rates for hard currencies the need to gear up for more creative resource sharing was felt. The two-fold purpose of the meeting was to increase the value of services to customers and to save on the expenditure of ISRO libraries. A sort of cooperative acquisition and/or consortia approach based on ABC analysis looked practical and useful as an initial step.

The meeting deliberated in greater detail and decided to take action as noted below and also to resolve certain operational problems like payment, follow up, supply destination, etc. Publishers/ suppliers have to be requested to extend proportional benefit to each participant library and receive payment from different libraries and to effect supply directly to individual libraries.

5. Broad areas of collective decisions:

CD-ROM databases: ISRO libraries subscribe to CD-ROM databases as shown in Table 7. The concessional prices for additional copies are substantial as depicted in the Table. It has been agreed to that ISAC library will cancel subscription to Ulrich+, Aerospace and Compendex databases and depend on VSSC library. In turn, VSSC library will cancel BIP+ and depend on ISAC library. Further VSSC library will change subscription to Ulrich+ for alternate year basis.

TABLE 7 : CONCESSIONAL PRICES FOR ADDITIONAL COPIES OF CD-ROM DATABASES

Title	No. of Libraries	Price	Adtl. Copy price	Saving
1. Aerospace Database	3	\$ 4890	4450	880
2. Books in Print Ondisc	2			
a) With reviews		UKP 1250	800	450
b) without reviews		UKP 875	600	
3. Ei-Compendex (Dialog)	2	\$ 6795	6387	408
4. INSPEC On Disc	3	UKP 6935	5100	3670
5. NTIS	2			
a) Silverplatter		\$ 3000	2351	649
b) Dialog		\$ 3000	2820	
6. Ulrich ondisc	2	UKP 575	400	175
TOTAL		UKP 4295 + \$ 1937		

All additional copy subscriptions will be at reduced prices as indicated in Table 7. The cancellations would save about \$ 11,685 + Pound 2115 per year and availing additional copy price would save another \$ 1089 + Pound 3670 per year.

TABLE 8 : OVERLAPPING SUBSCRIPTION TO (SRIM) MICROFICHE REPORTS

Cat. No.	Category Name	No. of Libraries	No. of reports/yr	Saving (in Rs.)
1. 46E	STRUCTURAL MECHANICS	2	76	19000
2. 49A	ANTENNAS	2	6	1500
3. 49B	CIRCUITS	2	8	2000
4. 49E	OPTOELECTRONIC DEVICES & SYSTEMS	2	82	20500
5. 62B	COMPUTER SOFTWARE	2	400	100000
6. 81B	ELECTRIC & ION PROPULSION	2	12	3000
7. 81C	FUEL & PROPELLANT TANKS	2	3	750
8. 81H	ROCKET PROPELLANTS	2	19	4750
9. 84A	ASTRONAUTICS	2	59	14750
10. 84D	SPACECRAFT TRAJECTORIES & FLIGHT MECHANICS	2	11	2750
11. 84E	SPACE LAUNCH VEHICLES & SUPPORT EQUIPMENT	3	45	22250
12. 84F	SPACE SAFETY	3	6	3000
	Total		727	1.94 lakhs

AIAA and IEEE conference volumes:

As did for the year 2001, subscription for all AIAA papers will be made for one print (for ISAC) and one set CD-ROM (for VSSC) at \$ 8000 per annum saving \$ 3000 per year. The standing order procurement of about 300 conference volumes of IEEE per year (POP

+) as a package deal cost \$ 29,995 per year. Where as, print plus online access cost only \$ 40,990 resulting in a saving of about \$19,000 per year. It was decided to explore and opt for the combination subscription by ISAC and VSSC libraries.

SRIM Reports: The overlapping subscriptions to 12 subcategories of SRIM (Selected Research in Microfiche) as per Table 8 were examined and decided to eliminate duplication thus saving about Rs. 1.94 lakhs per year.

Journals: ISAC library identified 12 costly journals worth Rs.5.55 lakhs having overlapping subscriptions and came forward to propose their cancellation. Similar lists are being prepared by other libraries. Selected list of free e-journals worth Rs. 2.37 lakhs (Appendix I) and selected list of e-journals available free against print subscriptions worth Rs. 21.50 lakhs (Appendix II) prepared by ISAC library were also circulated among all ISRO libraries to consider cancellation of print subscriptions and to depend on free/ complimentary e-journals. Table 9 provides list of selected costly journals having reduced consortia/ additional copy price. It was decided to avail the offer by

TABLE 9 : CONSORTIA/ MULTIPLE COPY PRICE FOR SELECTED COSTLY JOURNALS

<i>Title</i>	<i>No. of Libraries</i>	<i>Price</i>	<i>Consortia Price / Discount</i>	<i>Saving (in Rs.)</i>
1. MATERIALS SCIENCE & TECHNOLOGY	2	\$ 1429	\$ 525	45200
2. SPACE TECHNOLOGY / LISTER SCIENCE	3	\$ 800	\$ 760	6000
3. IEEE ALL SOCIETY PERIODICALS PACKAGE (106 TITLES)	3	Rs. 1684750	2.5%	126356
4. IEEE CSLSP PACKAGE (17 TITLES)	1	503500	2.5%	12587
5. IEEE COMPUTER GRAPHICS & APPL.	3	32650	2.5%	2448
6. IEEE COMPUTER MAGAZINE / IEEE	2	50450	2.5%	2522
7. IEEE INTELLIGENT SYSTEMS MAGAZINE	3	30450	2.5%	2283
8. IEEE INTERNET COMPUTING MAGAZINE	2	30750	2.5%	1537
9. IEEE JI. ON SELECTED AREAS IN COMM.	1	24450	2.5%	611
10. IEEE PROCEEDINGS / IEEE	7	31500	2.5%	5512
11. IEEE SOFTWARE MAGAZINE / IEEE	2	33500	2.5%	1675
12. IEEE SPECTRUM / IEEE	3	12250	2.5%	918
13. IEEE TRANS. ON COMPUTERS / IEEE	2	59900	2.5%	2995
14. IEEE TRANS. ON ELECTRON DEVICES	1	42850	2.5%	1071
15. IEEE TRANS. ON IMAGE PROCESSING	2	4575	2.5%	2287
16. IEEE TRANS. ON MICROWAVE THEORY..	1	37300	2.5%	932
17. IEEE TRANS. ON NEURAL NETWORKS	1	35200	2.5%	880
18. IEEE TRANS. ON PATTERN ANALYSIS ..	1	55900	2.5%	1397
19. IEEE TRANS. ON SIGNAL PROCESSING	3	49050	2.5%	3678
20. IEEE TRANS. ON SOFTWARE ENGG.	3	55400	2.5%	4105
21. INTNL. JI. OF GEOGRAPHICAL INF. SC.	4	37748	3%	4530
22. INTNL. JI. OF REMOTE SENSING	4	127836	3%	15340
Total				2.45 lakhs

all libraries concerned, thus saving about Rs. 2.45 lakhs per year. It is interesting to note that subscription to 'Material science and technology' is \$1429 whereas subscription to second copy cost only \$525 thus a saving of Rs. 45200 per year on second copy alone. For a large number of journals, publishers/ suppliers have either not responded or positively responded with concessional multiple copy/ combination subscription prices. Hence, it was decided to go ahead with renewals of such journals for the year 2002 in the usual way with a note to review them periodically for future pricing policies.

e-Journals: Combination subscriptions like one print and additional copy in e-form save almost 80% to libraries. Table 10 lists such journals available through online access at a marginal additional cost. Similarly IEEE's electronics library (IEL) option has a huge saving if ultimate users are prepared for accepting e-journals (Table 11). In addition to all IEEE Journals, conference proceedings and standards, it provides free access to back issues since 1988, access to IEE journals and conference proceedings as well as a subset of INSPEC database hyper-linked to original articles. It has been decided to put these two options before users and library committees in the form of sample/ trial access to e-journals to assess the acceptance of users and take decision later in due course if user-acceptance to e-journals is positive. On a trial basis, ISAC library has decided to go for e-version of *IEE proceedings* in combination with print subscription of other ISRO libraries saving Rs.9600.

TABLE 10 : COSTLY JOURNALS HAVING MARGINAL ADDITIONAL COST FOR ONLINE ACCESS

Title	No. of Libraries	Price			Saving in Rs.
		Print	Electronic	P+E	
1. AIAA JOURNAL	2	\$ 1075	\$1075	\$1235	32000
2. ELECTRONICS LETTERS	2	P 792	P 792	P 876	4200
3. IEE PROCEEDINGS (ALL 12 PARTS	3	P1920	P 1920	P2016	9600
4. INTNL. JL. OF SATELLITE COMMUNICATIONS	3	\$ 1620	\$1620	\$1701	8100
5. JOURNAL OF CLIMATE	2	\$ 446	\$ 349	\$ 469	1150
6. JOURNAL OF GUIDANCE, CONTROL & DYNAMICS	6	\$ 595	\$ 595	\$ 685	22500
7. JOURNAL OF PROPULSION AND POWER	3	\$ 635	\$ 635	\$ 730	9500
8. JOURNAL OF SPACECRAFT AND ROCKETS	6	\$ 555	\$ 555	\$ 640	21250
9. MONTHLY WEATHER REVIEW /	2	\$ 420	\$ 338	\$ 443	1150
10. QUALITY & RELIABILITY ENGINEERING	2	\$1380	\$ 1380	\$1449	3450
11. SOFTWARE: PRACTICE & EXPERIENCE	2	\$2380	\$ 2380	\$2449	3450
				Total	1.16 lakhs

TABLE 11 : IEEE'S ELECTRONIC LIBRARY (IEL)

FORMAT	SITE 1	SITE 2	SITE 3
STAND ALONE CD-ROM	\$59,995	\$38,850	\$27,295
WEB VERSION	\$91,995	\$39,000	\$39,000

IEL includes all IEEE & IEE journals, conference volumes & standards with back files since 1988 and a subset of INSPEC database with hyperlink to primary papers.

Other issues: The meeting also deliberated other related issues like effective use of 'spacenet' for resource sharing among ISRO libraries, division of archiving

responsibility for bound journals, exploring ways of resource sharing in other areas like less costly information materials, standards, patents and planning for developing digital collections. It was also proposed to use substantial part of the savings achieved through this effort to build infrastructure needed for developing digital collections.

6. Conclusion:

The resource sharing efforts initiated by ISRO libraries is expected to result in savings almost worth Rs. 41 lakhs per year as shown in Table 12. In addition to those mentioned in the Table, opting for e-journals (Tables 9, 10 and 11) once accepted by users will lead to further huge savings. Savings at A in Table 12 exclude those costly journals being proposed for cancellation by VSSC, SAC, SHAR and other ISRO libraries.

TABLE 12: SAVINGS ENVISAGED AT THE END OF FIRST MEETING	
A. Savings by canceling duplicates & sharing (Rs.in lakhs)	
Microfiche reports	1.94
CD-ROM databases	7.37
Costly Journals (ISAC Library only)	5.55
SUB TOTAL	14.86
B. Savings through consortia/ combination / multiple copy price	
AIAA papers	1.50
IEEE conference volumes	19.00
CD-ROM databases	3.19
Costly journals	2.45
SUB TOTAL	26.14
TOTAL	41.00

User convenience: Users appear to be not so enthusiastic to use primary sources in e-form (e.g., e-journals) where as secondary sources like databases and reference documents (on CD-ROM or online) are not only quite convenient but also more efficient to search the required information by users and library staff. In other words, the documents requiring searching, browsing and consulting are preferred in e-form than those required to be read

continuously. As such the extent of savings achieved by opting for e-form for secondary

sources like CD-ROM databases could not be achieved to the same extent in case of e-journals. However a small beginning in terms of encouraging users to use e-journals (both free and paid) is made and possibility of setting up *journal gateway services* to enable users to access electronically all the journals subscribed by the entire group with standard search and inter-library-loan features is also explored.

Consortia approach: As mentioned earlier the idea of consortia approach to e-journals was floated by commercial publishers of journals as a pricing and marketing strategy. They want a group of libraries collectively take benefit of reduced prices of e-journals by committing for subscription to print copy and/or e-journals for a few years. This service and other adjunct services like contents free, linkage from databases, gateway services, etc., are offered for a marginal fee or even free. It is important to note that most not-for-profit professional organisations offer their e-journals as well as adjunct services free to users.

Implementation problems: It is surprising that many publishers do not adequately publicise various pricing options including concessional prices for journals, CD-ROM databases and other package deals. It is even more disappointing that many Indian agents including exclusive agents are either not aware of such pricing information or deliberately withhold information about many such options. One of the exclusive agents tried to back out after agreeing by telling that their consortia offer is only for single consolidated order with uniform terms, single payment and single point of delivery defeating the very purpose of consortia approach. In another case where multiple agents are involved, placing consolidated order on one agent has probably made the other agents to approach publishers to withdraw the consortia price under the excuse that it is applicable only for fresh subscriptions and *not* for renewals. In addition, the known barriers like ownership paradigm, aspiring for local self-sufficiency goals and autonomy for individual libraries, fear of centralisation, size and status consciousness of established libraries, psychological and egoistic barriers, social loafing, etc. (Sridhar, 1995) are required to be effectively overcome.

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ACRONYMS USED:

ADRIN	Advanced Data processing Research Institute
AIAA	American Institute of Aeronautics and Astronautics\
IEE	Institute of Electronics Engineers (UK)
IEEE	Institute of Electrical and Electronics Engineers (USA)
ISAC	ISRO Satellite Centre (Bangalore)
ISRO	Indian Space Research Organisation
ISTRAC	ISRO Telemetry, Tracking & Command Network
LEOS	Laboratory for Electro-Optic Systems
MCF	Master Control Facility (INSAT)
RLG	Research Libraries Group
SAC	Space Application Centre (Ahmedabad)
SRIM	Selected Research in Microfiche (NTIS)
VSSC	Vikram Sarabhai Space Centre (Trivandrum)

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APPENDIXES:

I SELECTED FREE E-JOURNALS

Journal	Web Address	Price for print version
1. 21 st Century Science & Technology	www.21stcenturysciencetech.com	\$ 50.00
2. AAVSO Alert Notices - Web & E-mail free	www.aavso.org/publications	\$ 12.50
3. AAVSO Circular (Ceased since 2001)	www.aavso.org/publications	\$ 50.00
4. AAVSO Newsletter, Bulletin	www.aavso.org	----“----
5. American Machinist	www.amricanmachinist.com	\$ 185.00
6. American Scientist	www.amsci.org/amsci	\$ 64.00
7. Bombay Hospital Journal	www.bhj.org/journal	Rs 100.00
8. Bulletin of Materials Science	www.ias.ac.in/journals	Rs 3250.00
9. Cable & Satellite Europe	www.informamedia.com	P 99.00
10. Circuits Assembly - only current issue	www.circuitsassembly.com	\$ 145.00
11. Communications International - Free from 1997	www.ci-online.net	P 86 00
12. Computer World	www.computerworld.com	\$ 295.00
13. Computers @ Home 1998+	www.computersathome	Rs 500.00
14. Computers Today	www.computers-today.com	Rs 300.00
15. Current Science	www.ias.ac.in/journals	Rs 3000.00(CP)
16. Dataquest 1998+	www.dataquest.com	Rs 288.00
17. Digit	www.chip-india.com	Rs 1000.00
18. Discover - free from 1992	www.discover.com	\$ 44.95
19. Economic & Political Weekly -1999+	www.epw.org.in	Rs 800.00
20. EDN Magazine	www.ednmag.com	\$ 257.90
21. Electronic Business - free from 1998	www.eb-mag.com	\$ 157.90
22. Electronic Packaging & Production	www.epp.com	\$ 188.90
23. Fujitsu - (Special issues since 1997)	www.magazine.fujitsu.com/us/	Gratis
24. IBM Journal of Research & Development	www.research.ibm.com/journal	\$ 205.00
25. IBM Systems Journal - Free from 1994	www.research.ibm.com/journal	\$ 90.00
26. Indian Concrete Journal	www.icjonline.com	Rs 325.00
27. Issues in Science & Technology	www.nap.edu/issues	\$ 65.00
28. ITU Newsletter	www.itu.int/itunews	SFr 100.00
29. Journal of Astrophysics & astronomy	Error! Bookmark not defined.	Rs 3000.00(CP)
30. Journal of Biosciences	Error! Bookmark not defined.	Rs 3000.00(CP)
31. Journal of Quality Technology of Standards & Technology - Free from 1995	www.asq.org	\$ 100.00
32. Lubrication Engineering - free from 2000	www.stle.org	\$ 115.00
33. Machine Design	www.machinedesign.com	\$ 165.00
34. Mechanical Engineering	www.memagazine.org	\$ 175.00
35. Microwave Journal	www.mwjjournal.com	\$ 165.00
36. Packaging Digest - Current issue	www.packagingdigest.com	\$ 174.90
37. Physics Today - Free from 2000	www.physicstoday.org	\$ 310.00
38. Physics World - Current issue	www.physicsweb.org	\$ 149.00
39. Portable Design	www.portabledesign.com	\$ 235.00
40. PC Magazine -1995+	www.pcmag.com	\$ 62.99
41. PC Quest -1998+	www.pcquest.com	Rs 769.00
42. Pramana - Journal of Physics	www.ias.ac.in/journals	Rs 3000.00(CP)
43. Proceedings of the IAS: Chemical Sciences	www.ias.ac.in/journals	Rs 3000.00(CP)
44. Proceedings of the IAS: Earth & Planetary Sci.	www.ias.ac.in/journals	Rs 3000.00(CP)
45. Proceedings of the IAS: Mathematical Sciences	www.ias.ac.in/journals	Rs 3000.00(CP)
46. Resonance - Journal of Science Education	www.ias.ac.in/journals	Rs 3000.00(CP)
47. RF Design	www.rfdesign.com	\$ 71.00

48. Robotics World	www.douglaspublications.com	\$ 82.00
49. Scientific American - free from 1996	www.sciam.com	\$ 55.00
50. Sadhana -Proceedings in Engineering Science	www.ias.ac.in/journals	Rs 3000.00(CP)
51. Simulation	www.scs.org	\$ 203.00
52. Solid State Technology - only current issue	www.solid-state.com	\$ 180.00
53. Space & Communications	www.spaceandcommunications.com	\$ 88.00
54. Space News	www.spacenews.com	
55. WMO Bulletin - Current issue	www.wmo.ch	SFr 50.00
CP = Combination Price for 11 titles	Total (approx.)	Rs. 2. 37 lakhs

II FREE E-JOURNALS AGAINST PRINT SUBSCRIPTION

Title	Price of print version
1. Journal of Structural Engineering	31694.00
2. Astronomy & Astrophysics	125163.00
3. Astronomical Journal	22816.00
4. Astrophysical Journal + Letters	27528.00
5. Astrophysical Journal Supplement series	combi. sub
6. Publications of the Astronomical Society of the Pacific	13243.00
7. Mercury	combi.sub
8. Business Week	4050.00
9. Lancet	26250.00
10. AIX Update	13335.00
11. Journal of Navigation	10080.00
12. Knowledge Engineering Review	9240.00
13. Aviation Week & Space Technology	8680.00
14. Electronic Library	12530.00
15. Journal of Engineering Materials & Technology	12152.00
16. Journal of Heat Transfer	14880.00
17. Journal of Mechanical Design	12648.00
18. Journal of Tribology	12896.00
19. Optical Engineering	27776.00
20. Acta Astronautica	144584.00
21. Aircraft Design	combi.sub
22. Composite Structures	157133.00
23. Computer Aided Design	63934.00
24. Computers & Structures	233765.00
25. Cryogenics	88238.00
26. Finite Elements in Analysis & Design	54758.00
27. Intl. Communications in Heat & Mass Transfer	234707.00
28. Intl. Jl. of Heat & Mass Transfer	combi.sub
29. Intl. Jl. of Project Management	37845.00
30. ISA Transactions	18401.00
31. ISPRS Jl. of Photogrammetry & Remote Sensing	21725.00
32. Jl. of Engineering & Technology Management	15277.00
33. Journal of Power Sources	143096.00
34. Materials & Design	39828.00
35. Mechanism & Machine Theory	104457.00
36. Microelectronics Reliability	117651.00
37. Microprocessors & Microsystems	27825.00
38. Optics & Lasers Technology	48657.00
39. Progress in Aerospace Sciences	62347.00
40. Solar Energy Materials & Solar Cells	84469.00
41. Tribology international	62149.00
Total (approx)	21.5 lakhs

About the Author

Dr. M.S.Sridhar is a post graduate in mathematics and business management and a doctorate in library and information science. He is in the profession for last 35 years. Since 1978 he is heading the Library and Documentation Division of ISRO Satellite Centre, Bangalore. Earlier he has worked in the libraries of National Aeronautical Laboratory (Bangalore), Indian Institute of Management (Bangalore) and University of Mysore. Dr. Sridhar has published four books ('User research: a review of information-behaviour studies in science and technology', 'Problems of collection development in special libraries', 'Information behaviour of scientists and engineers' and 'Use and user research with twenty case studies') and 74 research papers, written 19 course material for BLIS and MLIS, presented over 22 papers in conferences and seminars, and contributed 5 chapters to books.

