

Mathematical Collaborations

*how to kickstart &
maintain dreams*

Nalini Joshi





	<u>thru 90s</u>	<u>thru 80s</u>	<u>thru 70s</u>	<u>thru 60s</u>	<u>thru 50s</u>	<u>thru 40s</u>
number of papers	1598	1010	572	278	109	30
number of authors	337	225	137	68	29	10
ave. authors/paper	1.45	1.35	1.27	1.20	1.14	1.10
s.d. authors/paper	1.63	1.50	1.40	1.31	1.28	0.36
1-auth papers	66%	73%	78%	84%	88%	91%
2-auth papers	26%	22%	18%	13%	11%	8%
3-auth papers	7%	4%	3%	2%	1%	1%
> 3-auth papers	1%	1%	1%	1%	0%	0%
ave. papers/author	6.87	6.05	5.30	4.89	4.33	3.41
s.d. papers/author	15.34	12.91	11.26	10.49	8.88	5.70
collaborating authors	253	153	82	34	11	3
fraction of all authors	75%	68%	60%	49%	39%	28%
ave. collaborators/auth	2.94	2.26	1.67	1.20	0.83	0.49
ave. collaborations/auth	5.65	4.08	2.87	2.01	1.36	0.75
ave. coll'tors/col. auth	3.92	3.33	2.79	2.42	2.14	1.74
ave. coll'tions/col. auth	7.52	6.00	4.77	4.07	3.50	2.65

Table 1. Cumulative data, by decade; integer figures in thousands

Cumulative Math Review data

	<u>90s only</u>	<u>80s only</u>	<u>70s only</u>	<u>60s only</u>	<u>50s only</u>	<u>40s only</u>
number of papers	587	439	294	168	80	30
number of authors	192	144	97	51	24	10
ave. authors/paper	1.63	1.45	1.33	1.23	1.16	1.10
s.d. authors/paper	1.82	1.63	1.48	1.35	1.26	0.36
1-auth papers	54%	66%	73%	81%	87%	91%
2-auth papers	33%	27%	22%	16%	11%	8%
3-auth papers	10%	6%	4%	2%	2%	1%
> 3-auth papers	3%	1%	1%	1%	0%	0%
ave. papers/author	4.97	4.43	4.03	4.05	3.84	3.41
s.d. papers/author	8.31	6.91	6.15	6.60	6.73	5.70
collaborating authors	155	104	62	27	9	3
fraction of all authors	81%	72%	64%	52%	41%	28%
ave. collaborators/auth	2.84	2.16	1.62	1.18	0.84	0.49
ave. collaborations/auth	5.14	3.66	2.62	1.90	1.34	0.75
ave. coll'tors/col. auth	3.51	2.99	2.55	2.25	2.08	1.74
ave. coll'tions/col. auth	6.35	5.06	4.11	3.64	3.31	2.65

Table 2. Data for each decade; integer figures in thousands

Decadal Data MR

The Beginning

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- Read widely & *between the lines*

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- Go to seminars & *imagine questions*
- Attend conferences & *sharpen your interests*
- Set up a reading group *in areas that interest you*
- Find others *willing to talk*

Next Steps

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- Ask questions
 - *To understand*
 - *To explore boundaries*
 - *To clarify echoes*

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- Talk to someone
 - *sounding-board*
 - *reality check*
 - *to get ideas*

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- Ask questions
 - *To understand*
 - *To explore boundaries*
 - *To clarify echoes*
- Find team players
 - *Common interests*
 - *Collegiality*
 - *Confidence*
- Talk to someone
 - *sounding-board*
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 - *to get ideas*

Next Steps

- Ask questions
 - *To understand*
 - *To explore boundaries*
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- Find team players
 - *Common interests*
 - *Collegiality*
 - *Confidence*
- Talk to someone
 - *sounding-board*
 - *reality check*
 - *to get ideas*
- Give talks
 - *Across institutions*
 - *Across countries*
 - *Across fields*

Basic Skill Set

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- Self reflection

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- Energy

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- Energy
- Openness

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- Openness
- Passion & commitment

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- Taking the first step

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- Diplomacy

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- Diplomacy
- Caring about others

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- Self reflection
- Ability to listen
- Energy
- Openness
- Passion & commitment
- Fearlessness
- Taking the first step
- Diplomacy
- Caring about others
- Collegiality
- Trust

Basic Skill Set

- Self reflection
- Ability to listen
- Energy
- Openness
- Passion & commitment
- Fearlessness
- Taking the first step
- Diplomacy
- Caring about others
- Collegiality
- Trust
- Looking after yourself

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- Work on difficult problems but find some accessible directions that reach others
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- Give accessible talks
- Give praise where it is due
- Criticise, but not defensively
- Be open but not naive
- Fight for your rights

International Collaborations

- Travel, travel, travel
- Talk often, at conferences, by phone, over skype, by email, ...
- Map out plans, priorities & goals
- *Remain passionate ...*