M2O Telecom, No. 19

The main news items this month:

Papers: Stecklum et al. accepted, Hirota et al. in internal review, Bayandina et al., first draft

Maser flares: Water maser flare in G35.200.74, discovered by A. Vlovach (Sz). Followed up with KaVA (R. Burns) and Hart (22, 6.7, 12 GHz, F. v.d. Heever). No flare seen in 6.7 GHz (Y. Yonekura).

New proposals: RB: Plans to submit EVN regular proposal to image post-flare 6.7 GHz targets. Also resubmit our VLBA trigger proposal (Deadline 1 Feb 2021 for both).

Announcements: PhD position (Claudia Cyganowski), and JCMT transients collab.. (See Reports)

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1 Activity since the previous Telecom

- **SamePage:** +2 (Doug Johnstone JCMT transients, Claudia Cyganowski) total 72 members.
- **Papers accepted:** +1 (Stecklum et al. accepted to A&A); Total: 16
- **Papers in revision:**
- **Updates on papers in prep:**
  - Bayandina et al., VLA masers in G358, first draft ready
  - Burns et al., 6.7 GHz VLBI movie in G358. Drafting and further analyses (see Telecom18 Report)
  - Burns et al., VLBI maps of rare maser lines in G358. (See Telecom15 Report)
  - Orosz et al., 7.6 and 7.8 GHz methanol masers in G358, aiming for ApJL
  - Hirota et al., G24.33+0.14 ALMA follow-up; pre- and post- maser flare phases. (see SP). Int. rev.
  - Olech et al., VLBI images of G24.33 during its maser flare.
  - Gray et al., Two additions to the maser flare series: compression and skyplane overlap scenarios.

- **M2O targets:**

Name	Maser [GHz]	Pre-burst Flux [Jy]	Max Flux [Jy]	Current Flux [Jy]	Reported by	Reobserved by	Status
G359.617-0.251	6.7	120	200	100	Yonekura	Ib, Hh,	stable
Orion S6	6.7	3.1	9	2	Yonekura	Ib, Tr, Sz, Hh	variable
G85.411+0.002	6.7	12	95	95	Yonekura	Ib, Ef, Sz, Tr, Hh, Ky, Vs	decreasing
G33.641-0.228	6.7	-	236	43	Bringfried	Hh, Ib, Vs	eruptive
IRAS 16293-2422	22	-	30k	-	Sunada, Mc	Vr, Mc, Hh, Sz, Ib	-
NGC2071	22	1k	7k	920	Sunada, Hh	Vr, Hh, Sz, Ib	post-burst
G53.22-0.08	22	3	800	30	Sunada	Vr, Hh, Ib	post-burst
G358.93-0.03	6.7	5	1000	20	Yonekura	Hh, Ib	decreasing
G24.33+0.14	6.7	-	800	7	Torun	Hh, Ib, Vs	post-burst
G25.65+1.05	22	-	60k	2150	Volvach	Hh, Sz	post-burst
G034.196-0.592	22	-	120	120	Ladeyschikov	Sz, Oa, Hh	?
G35.200.74	22	600	4k	4k	Volvach	Sz, Hh, Ib	?

(Ib = Ibaraki) (Tr = Torun) (Sz = Simeiz) (Hh = HartRAO) (Ef = Effelsberg) (Ky = KVN Yonsei) (Vs = Ventspil) (Vr = VERA stations) (Mc = Medicina) (Ps = Puschino) (Oa = OAO-WFC)

- **New observing proposals:**
  EVN Post-burst follow-up imaging (Burns; in prep.): Which targets?
  VLBA Triggerable ToO (Burns; in prep.)
- **Active trigger proposals:**

Array	Code	Grade	Hours granted target x epoch x hour	Hours remaining	Active period	Resubmit deadline
EVN	EB083	1.2 / 5.0 (0 is best)	(3x2x8)x2 bands = 96	96	15/SEP/20 - 15/SEP/21	1/JUN/21
KaVA	EAVN21A-213	7.6 / 10.0 (10 is best)	2 x 1 x 8 = 16	16	01/FEB/21 - 01/SEP/21	1/JUN/21
EAVN	EAVN21A-214	8.3 / 10.0 (10 is best)	1 x 2 x 8 = 16	16	01/FEB/21 - 01/SEP/21	1/JUN/21
LBA	V581	4.1 / 5.0 (5 is best)	96	88	01/OCT/20 - 01/OCT/21	16/JUN/21
VLBA	BB418	1.82 / 10.0 (0 is best)	48	48	01/AUG/20 - 01/AUG/21	01/FEB/21
Subaru	S20B0051N	accepted	0.5*2 or 1 night	0.5*2 or 1 night	01/AUG/20 - 01/JAN/21	-

- **Follow-up observations conducted this month (see Record Keeping):**
  KaVA ((K)QWD) of G034.196-0.592 2nd epoch, with G35.200.74 1st epoch piggy-back, both are 22 GHz maser flare sources.

2 Reports

Short reports on specific activities, please send me an email (ross.burns@nao.ac.jp) in advance if you have something to report in an upcoming telecom.

JCMT Transient program collaboration (R. Burns)
In the previous telecom there was discussion about the need for increasing ground based IR facilities. In line with this, possible collaboration ideas with the JCMT transients programme was initiated.
We had a Zoom call on 16 Dec 2020
M2O participants included Kt. Kim, Y. Yonekura, and R. Burns

Link to the JCMT transients program survey paper:
https://ui.adsabs.harvard.edu/abs/2017ApJ...843...55M/abstract

JCMT: 450, 850 micron (FIR) [remember SOFIA G358]
Monthly Monitoring 20srcs in 8 regions
(Perseus, Orion, Ophiucius, Serpens)
Looking for evidence of protostellar accretion.
Src list contains 6 HMSFRs
Observations processed in a day or so. Can find transients with plenty of time to pull triggers.

Collaboration ideas:
JCMT finds flare -> M2O follows up
M2O finds flare -> JCMT follows up
To support this possibility Doug Johnstone has joined M2O SamePage and I have been allowed to join their Slack communications

Another, more focused collab idea:
'Blind' M2O SD maser search of JCMT monitoring FOVs to look for 6.7 GHz maser emission:
Search for previously undetected 6.7 GHz masers (incl. previously missed due to variability)
Revisit previously known 6.7 GHz masers to look for recent flux changes.
What this would entail:
1. Crossmatch: JCMT FOVs, the MaserDB, the cumulative M2O list of monitored masers
2. Designing (sensitivity and declination limits) and conducting a SD observation program

Therefore: I revived efforts at establishing a Cumulative M2O maser list. So far I've got maser src lists from several observatories. In the case that observatories dont want to share their latest source list info I will go on their past publications.

Other benefits of establishing an M2O source list:
Identifying masers not yet being monitored by crossmatch M2O list with the MaserDB
Advising source lists for new monitoring proposals and new facilities
Useful to know the total number of monitored source when writing proposals

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PhD position opening. Forwarded message from C. Cyganowski
Hello everyone, Karl Menten and I have funding for a joint PhD position (co-tutelle between St Andrews and Bonn) related to accretion bursts in high-mass star formation and submillimetre-wavelength methanol masers and wanted to advertise it to the M2O community–please could you distribute the ad https://www.st-andrews.ac.uk/study/fees-and-funding/postgraduate/scholarships/global-astrophysics/ to potentially interested students and/or relevant lists? The position is fully funded (3.5 years) and open to students of any nationality, application deadline Feb 15;
Informal inquiries welcome to me (cc243 at st-andrews.ac.uk) or Karl.
Thanks, and best wishes,
Claudia

Next Newsletter / Telecom: 26th Feb 2020, 18:00 JST

Record keeping

3 M2O Publications

No.	Target	Facility	Author	Frequency (GHz)	Status	Ref	Journal
1	W49N	Sm, Tr	Volvach+	22.2	Published	(1)	MNRAS_L
2	W49N	Sm, Tr, Mc, Ef	Volvach+	22.2	Published	(2)	A&A
3	W49N	Sm, Tr, Mc, Ef, Kvazar	Volvach+	22.2	Published	(3)	Ast.Rep.
4	W49N	Sm	Volvach+	22.2	Published	(4)	MNRAS
5	G25	VLA	Bayandina+	6.7, 12.2, 22	Published	(5)	ApJ
6	G25	Sim/Hh/Tr	Volvach+	22	Published	(6)	MNRAS_L
7	G25	KVASAR	Volvach+	22	Published	(7)	Ast.Rep.
8	G25	EVN	Burns+	22	Published	(8)	MNRAS
9	G25		Aberfelds+	6.7	in prep		-
10	G25		Bayandina+	12.2, 23.1	in prep		-
11	G25		MacCleod+	6.7, 22	in prep		-
12	G358	ATCA	Breen+	mm	Published	(9)	ApJ
13	G358	ALMA-SMA	Brogan+	mm	Published	(10)	ApJL
14	G358	Hh	MacCleod+	New Methanol masers	Published	(11)	MNRAS
15	G358	LBA	Burns+	6.7	Published	(12)	Nat.Ast.
16	G358	Various VLBI	Burns+	6.7 movie	in prep		-
17	G358	Various VLBI	Burns+	Maps of rare masers	in prep		
18	G358	VLBA	Burns+	6.7 and 12.18	in prep		
19	G358	Asia-Pacific VLBI	Orosz+	7.6, 7.8	in prep.		ApJL
20	G358	VLA	Chen+	multiple lines methanol	Published	(13)	ApJL
21	G358	VLA	Chen+	New lines + Methanol	Published	(14)	Nat. Ast.
22	G358		MacCleod+	6.7 GHz monitoring	in prep		
23	G358		MacCleod+	6.2, 12.2, 20.3, 20.9	in prep		-
24	G358	VLA	Bayandina+	6.7, 12.2, 22.2	in prep		-
25	G358	SOFIA	Stecklum+	FIR	published	(15)	A&A
26	G358	Sm and Hh	Volvach+	19.9, 20.9	Published	(16)	MNRASL
27	G358	ATCA	Breen+	Rare transitions	in prep		-
28	G24.33	EVN, VLBA	Olech+	6.7, 12.2, 22.2	in prep		-
29	G24.33	Tr	Olech+	OH, Meth	in prep		-
30	G24.33	Hh	v. d. Heever+		in prep		-
31	G24.33	ALMA	Hirota+	Thermal and maser	in prep		-

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M2O follow-up data

No.	Target	Facility	Date	Frequency (GHz)	Code	PI/comment
1	G25	VLA	Oct 2017	6.7, 12.2, 22	17B-408	OB / Reduced
2	G25+W49N	EVN	Oct 2017	22	RB004	RB / Reduced
3	G25+W49N	KaVA	Oct 2017	22	K17RB01A	RB / Reduced
4	G25+W49N	VLBA	Oct 2017	22	BO058	GO / Reduced
5	G25	VERA	2007-2013	22, 16 x epochs	[archival]	K. Motogi / Processing
6	G358	VERA	31 Jan 2019	6.7	-	SY / Reduced
7	G358	VERA	3 Mar 2019	6.7	-	SY / Reduced
8	G358	VERA	1 Apr 2019	6.7	-	SY / Reduced
9	G358	VERA	3 May 2019	6.7	-	SY / Reduced
10	G358	LBA	2 Feb 2019	6.7	vc026a	RB / Reduced
11	G358	LBA	3 Feb 2019	23.1	vc026b	GO / Abandoned
12	G358	LBA	28 Feb 2019	6.7	vc026c	RB / Reduced
13	G358	EVN	13 Mar 2019	6.7, 6.18	RB005	RB / Reduced
14	G358	KVN	25 Mar 2019	22, 44, 95, 120	n19rb01a	RB / Reduced
15	G358	VLBA	19 May 2019	6.7, 12.2, 23.1	BB414	RB / QuickLook
16	G358	VLBA	7 Jun 2019	6.7, 12.2, 20.7	BB412	RB / Reduced
17	G358	LBA+E.Asia	17 May 2019	7.6, 7.8	vx028a	GO,SE / QuickLook
18	G358	LBA+AusSCOPE	28 Sep 2019	6.7	v581a	RB / Reduced
19	G358	LBA+AusSCOPE	18 Aug 2020	6.7	v581b	RB / Reduced
20	G358	SOFIA	30 April 2019	50...120 μm		BS,JE
21	G358	GROND	8 Feb 2019	NIR		HL,BS,AC
22	G358	SMA	several 2019	mm		THunter,CB
23	G358	ALMA	several 2019	Bands 5,6,7		CB
24	G358	VLA	2019	GHz	-	OB
25	G358	VLA	2019	GHz	-	OB
26	G358	VLA	2019	HNCO	-	XC,AS
27	G24	LBA	8 Sep 2019	6.7	vx026d	RB,MO / Correlated
28	G24	LBA	13 Sep 2019	6.7	s002a	RB,MO / Correlated
29	G24	LBA	28 Sep 2019	6.7	v581a	RB,MO / Correlated
30	G24	EVN	22 Sep 2019	22	RB006A	RB,MO / QuickLook
31	G24	EVN+Merlin	7 Oct 2019	6.7	RB006B	RB,MO / QuickLook
32	G24	EVN+Merlin	17 Nov 2019	1.667	RB007	RB,MO / correlated
33	G24	VLBA	27 Sep 2019	6.7, 12.2, 22	BB416A	RB,MO / QuickLook
34	G24	VLBA	27 Oct 2019	6.7, 12.2, 22	BB416B	RB,MO / correlated
35	G24	VLBA	02 Dec 2019	6.7, 12.2, 22	BB416C	RB,MO / correlated
36	G24	ALMA	26 Sep 2019	Band6	-	THirota / QuickLook
37	G24	SOFIA	25 Oct 2019	FIR		BS,JE
38	G24	ATCA	26 Nov 2019	K-band	C3321	GO,SB
39	G24	ATCA	27 Nov 2019	C-band	C3321	GO,SB
40	NGC2071, Ori-S6	KaVA	13 Mar 2020	22/44/95/130	a20d3a	RB / QuickLook
41	NGC2071, Ori-S6	KaVA	16 Apr 2020	22/44/95/130	a20d3b	RB / QuickLook
42	NGC2071, Ori-S6	KaVA	11 May 2020	22/44/95/130	a20d3c	RB / Correlated
43	G85	VLBA	24/Apr/2020	L/C/Ku/K	BB421B	RB / QuickLook
44	G85	VLBA	22/May/2020	L/C/Ku/K	BB421A	RB / QuickLook
45	G85	VLBA	22/June/2020	L/C/Ku/K	BB421C	RB / correlated
46	G359.617-0.251	LBA	18/Aug/2020	6.7	V581B	RB / Observed
47	G359.617-0.251	VLBA	21/Aug/2020	6.7 / 12.2 / 22	BB418A	RB / Correlated
48	G359.617-0.251	ATCA	25-26/July/2020	6-10 GHz	C3321	GO / Processing
49	G034.196-0.592	VLA	19/NOV/2020	C	VLA/20B-441	DL / Processing
50	G034.196-0.592	VLA	29/NOV/2020	K	VLA/20B-441	DL / Processing
51	G034.196-0.592	KaVA	12/DEC/2020	K(QWD)	a20d4a	RB / Correlating
52	G034.196-0.592	KaVA	23/JAN/2021	K(QWD)	a21d1a	RB / Correlating
53	G35.200.74	KaVA	23/JAN/2021	K(QWD)	a21d1a	RB / Correlating

Reminders:
All G25.65+0.15 papers should include a member from the Volvach et al. in the author list and an acknowledgement of their funding.
All G358 papers should include a member from the Ibaraki team in the author list and an acknowledgement of their funding.
All G24.33 papers should include a member from the Torun team in the author list and an acknowledgement of their funding.
All Orion-S6 papers should include a member from the Ibaraki team in the author list and an acknowledgement of their funding.
All NGC2071 papers should include a member from the VERA / Sunada team in the author list and an acknowledgement of their funding.
All G53.22-0.08 papers should include a member from the VERA / Sunada team in the author list and an acknowledgement of their funding.
All G85 papers should include a member from the Ibaraki team in the author list and an acknowledgement of their funding.
All G359 papers should include a member from the Ibaraki team in the author list and an acknowledgement of their funding.
All G034.196-0.592 papers should include a member from the Ladeyschikov et al. in the author list and an acknowledgement of their funding.
All G35.200.74 papers should include a member from the Volvach et al. in the author list and an acknowledgement of their funding.