

# MIF Status Report

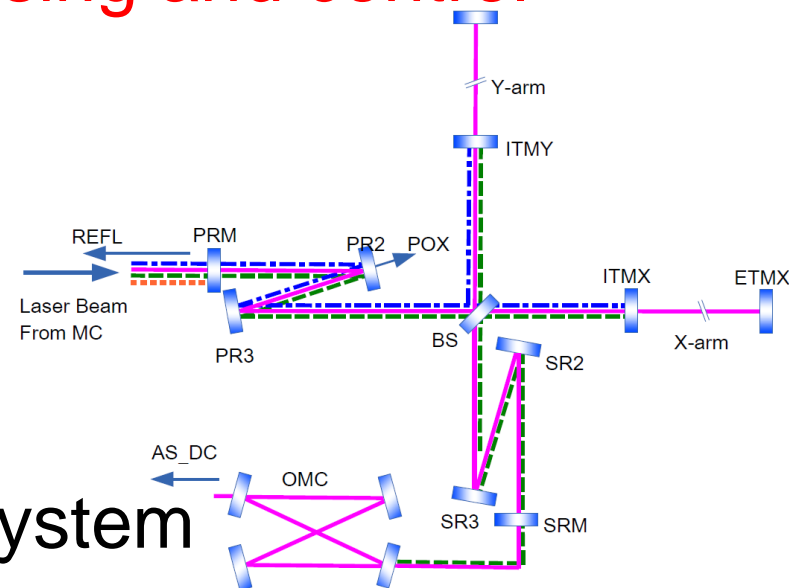
Yuta Michimura

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on behalf of the Main Interferometer subgroup

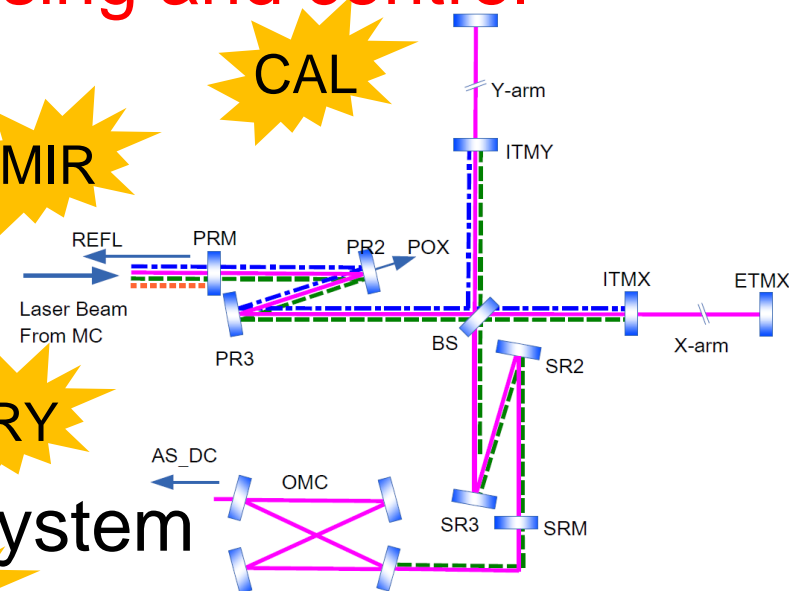
# Tasks for MIF Subgroup

- **Design** the Main Interferometer
- Maintain the optical **layout** of the interferometer
- Design length/alignment **sensing and control** scheme
- Define specs for the **mirrors**
- Derive **noise** requirements
- **Instrumentation** of controls system
- Interferometer **commissioning**



# Interfaces with Other Groups

- **Design** the Main Interferometer **VAC** **AOS**
- Maintain the optical **layout** of the interferometer
- Design length/alignment **sensing and control** scheme **DGS** **CAL**
- Define specs for the **mirrors** **MIR**
- Derive **noise** requirements **LAS** **IOO** **VIS** **CRY**
- **Instrumentation** of controls system **AEL**
- Interferometer **commissioning** **DetChar**



Commissioning Committee(?)

# iKAGRA Commissioning

- Electronics/cables, detection optics, realtime model for digital control, NoiseBudget model were prepared beforehand
- Initial alignment was appointed as a task for MIF group, and procedure was prepared beforehand
- Remaining tasks after suspensions installation, **from initial alignment to observation**, including **calibrations**, were done by spontaneous “commissioning team”
  - no more subgroup-oriented mind

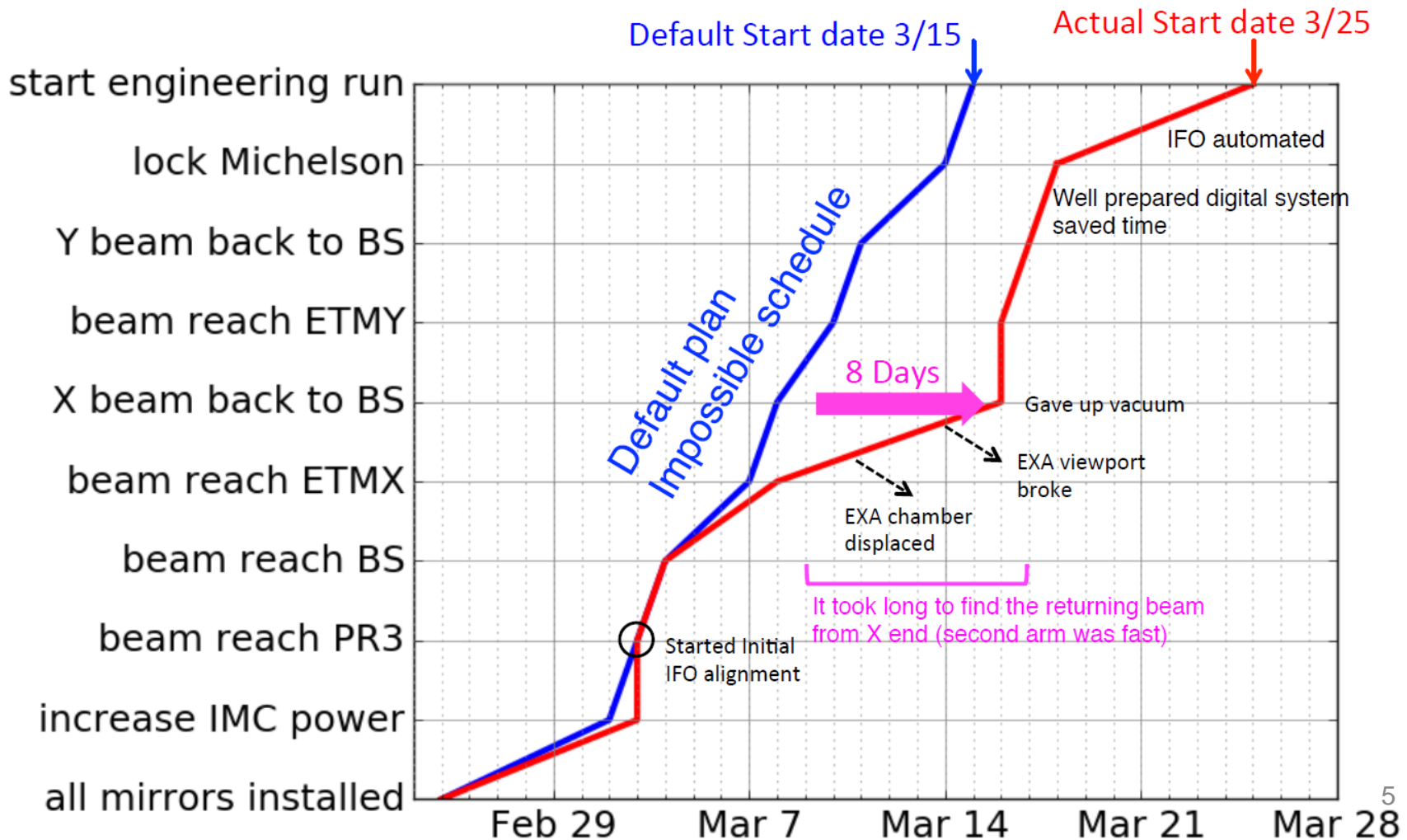
DON'T PANIC



ORGANISE!

# How IFO Integration Went

- Although there was a delay and incidents, integration went miraculously well



# Lessons from iKAGRA Preparation

- MIF **members** were not defined
- Only **few meetings** held
  - couldn't keep track of each task
  - lack of communication
- Definition of iKAGRA was different between people
  - **too much rescheduling, descoping**
  - demotivated to be well prepared too much
- **Responsibility** was not defined well
  - especially with IOO
    - IO ← PRM → MIF ← SRM → OO
  - also with Commissioning Committee

# Updates

- MIF **members** updated on June 2016
- **ISC Bi-Weekly Meeting** started on July 2015
  - not only MIF but ISC
  - MIF + IOO + MIR + AOS + DGS + AEL .....
  - 14:00-15:00 on every other Monday
  - you are more than welcome to join us!
- More communication with subgroups with interfaces
- Task assignment and tracking not complete yet; only few urgent ones (too much task tracking is also a big task and kills us)

# MIF Members

- Yuta Michimura (Chief, UTokyo) Chief and sub-chief swapped on May 2016
- Yoichi Aso (Sub-chief, NAOJ, VIS) swapped on May 2016
- Osamu Miyakawa (ICRR, AEL/DGS)
- Keiko Kokeyama (ICRR, DGS)
- Eiichi Hirose (ICRR, MIR)
- Tomotada Akutsu (NAOJ, AOS)
- Yutaro Enomoto (ICRR)
- Kentaro Komori (UTokyo)
- Naoki Aritomi (UTokyo)
- Tomofumi Shimoda (UTokyo)
- Koji Arai (Caltech) – support
- Hiroaki Yamamoto (Caltech) – support

Members updated on  
June 2016

(please let me know if  
you are willing to be a  
member!)





# Towards bKAGRA

- Modeling sensing and controls scheme for intermediate phases
  - Phase 1 ASC modeling [Enomoto's talk]
- Initial alignment and commissioning plan for intermediate phases [Michimura]
- Electronics, cables preparation [Michimura]
- Arm Length Stabilization system
  - NoiseBudget modeling [Kambara's talk]
- Output optics table [Michimura]
- OFI and OMC [Somiya's talk]
- FFT simulation for mirrors [Hirose]
- etc .....

# bKAGRA Phase 1 Commissioning

|             | 2017        |   |                  |           |              |          | 2018         |           |                                  |
|-------------|-------------|---|------------------|-----------|--------------|----------|--------------|-----------|----------------------------------|
|             | 7           | 8 | 9                | 10        | 11           | 12       | 1            | 2         | 3                                |
| Suspensions | PRs done    |   |                  | ETMY done | ETMY cool    | SRs done |              | ETMX done | ETMX cool                        |
| Alignment   | IMC to ends |   | beam collimation |           | Yend to REFL | BS to AS | Xend to REFL |           |                                  |
| Locking     |             |   |                  | LSC, ASC  |              |          |              | LSC       | LSC<br>TMS adjustment<br>try ASC |
| Cooling     |             |   |                  |           | ETMY         |          |              | ETMX      |                                  |

need 1 month before cooling

only 1 week before cooling (TOUGH!)

Give up PR if impossible

PR – ETMY cavity  
(10/16 - 11/17)

Michelson LSC  
(2/12 - 2/13)

PRMI LSC  
(2/14 - 2/16)

# bKAGRA Readiness

Not ready ← → Ready

|                    | Phase 1            | Phase 2               | Phase 3              |
|--------------------|--------------------|-----------------------|----------------------|
| Analog Electronics | requested to AEL   | some not yet designed | not yet designed     |
| Digital Control    | small modification | major modification    | major modification   |
| Initial alignment  | planning           | vague plan            | -                    |
| Output tables      | some designed      | no design             | upgrade?             |
| ALS                | -                  | modeling              | upgrade?             |
| Modeling           | almost complete    | exists but not fully  | exists but not fully |
| OFI / OMC          | -                  | designing             | upgrade?             |