ISOLDE ISCC Meeting

CERN, 27th June 2017

RILIS operational status and considerations

Bruce Marsh, *CERN EN-STI-LP*

EN Engineering Department

Outline

- Operational details - scheduling and manpower
    - summary of 2016
    - status in 2017

- Define on-call (as standard) RILIS operation
- Implications for level of support and scheduling
- Define Non-standard RILIS operation

- RILIS sustainability and outlook towards 2018

RILIS on-line operation in 2016

130 days of RILIS operation (mostly 24-hr)

22 separate RILIS runs

14 different elements

3 RILIS physics runs
(RILIS as a spectroscopy tool during ion beam production)

100 % record for on-time setup of RILIS

>75 % of ISOLDE physics

1 laser failure which required a factory repair
(it did not adversely affect operation)

RILIS team in 2016

72 person-months

Valentin Fedosseev

Section Leader
EN-STI-LP

Bruce Marsh

Staff Member
EN-STI-LP

Sebastian Rothe

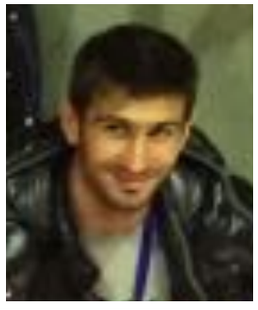
Previous COFUND Fellow
Visiting Scientist
Gothenburg / Manchester

Tom Day Goodacre

MC Fellow (LA3NET)
Final year CERN PhD student
Manchester University

Christoph Seiffert

COFUND Fellow
CERN



Pierre Larmonier

CERN VIA trainee
October onwards

Katerina Chrysalidis

Doctoral student
(Oct 16 onwards)
Univ. Mainz

Julia Sundberg

CERN PhD student
Univ. Gothenburg

+ 7.5 person-months PNPI support

RILIS team in 2017

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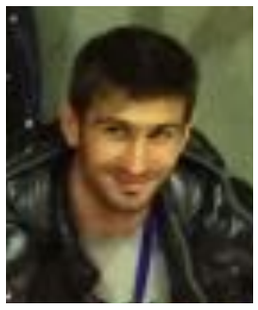

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CERN VIA trainee

Katerina Chrysalidis

Doctoral student
Univ. Mainz

We have lost 3 people with a combined RILIS experience of **14 years**

RILIS team in 2017

59 person-months

Valentin Fedosseev

Section Leader
EN-STI-LP

Bruce Marsh

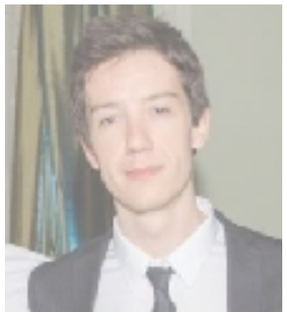
Staff Member
EN-STI-LP

Student #2

Externally funded
Mid-late summer?

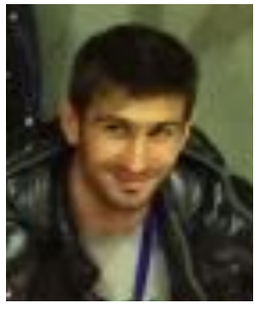
Camilo Buitrago

CERN Fellow
April 2017 onwards



Fellow #2

CERN Fellow
Shane Wilkins
Starting October 2017



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CERN VIA trainee

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Doctoral student
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+ 8 person-months PNPI support

Extended RILIS setup time

Reduced on-call support (no backup)

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We are far from having the manpower for a standard 24-hr ‘service’

Valentin Fedosseev (SL)

- 1 Staff member
- 1 Student (TECH, DOCT)
- 1 Fellow
- up to 2 visiting scientists

Staff Rules and Regulations + AC23	Rest period ≠ compensatory leave
Service organized for a period of ≥ 1 month	Max nb of hours on duty = (7x24)-40=128h/week, max 9(12) weeks/ year *(-> 6 persons !)*
≥5(4) persons in turn are on-call after working hours (from call from CERN)	If > 55 year old, one can refuse to be on duty
Staff members and paid associates	The Division leader decides who can call the Piquet (+log name, time, reason for call, duration, …)
“free stand-by” person in action = “stand-by”	

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The Students and Fellows have their own projects and commitments in addition to RILIS maintenance, setup and operation

Students should not be placed in a position of sole responsibility for the RILIS installation

According to CERN rules for students:
Out-of-hours or shift work is only allowed if they are an active participant of an experiment

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Whilst 24-hour 7-days a week unlimited RILIS operation is anyway not possible for obvious reasons (switching time, laser maintenance, etc),
On-call, rather than **on-shift** operation is now feasible for almost all experiments

Main advantages of On-call operation

1) More reasonable working conditions for RILIS team

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2) Alleviate the scheduling restrictions and increase annual RILIS use

3) Release more time for more RILIS development opportunities

Shift-based operation **Vs** On-call operation

RILIS Requirements - prerequisite for scheduling an experiment:

Minimum of **4 RILIS personnel**
+ 1 experienced person
who is not on the shift rota

Minimum of **2 RILIS personnel** (on-call+backup)
plus 1 experienced Staff member or Fellow

At least 2 people are needed for initial RILIS setup and optimisation

Scheduling **restrictions**

No more than 3 consecutive
weekends of RILIS operation

1 absence due to official travel =
RILIS unavailability during that period

2 week break during the summer for holidays

1 working-hours day
every 10 operating
days for maintenance
OR
2 days every 2 RILIS
runs

No RILIS setup or unusual operation during weekends, holidays or outside normal working hours

Implications and other considerations

- The on-call person is required to be available at RILIS within **1 hour** of being contacted

- It may not be possible for the on-call or backup person to solve an equipment failure or technical problem occurring during out-of-hours operation

- The other members of the RILIS team will assist if available but their availability is on a ‘best-effort’ basis.

Definition of non-standard RILIS Operation

- Visiting scientists and students conducting **shift work rather than on call** for an experiment should be considered to be active participants of that experiment.

- If a particular experiment requires an unusual extra degree of complexity during setup, optimisation and operation (isomer separation, optical pumping etc) then the RILIS participants involved should be seen as active participants of the experiment.

- If specific RILIS development work is required during an otherwise standard RILIS run, then we consider those performing the work to be participants of that experiment. E.g. ionization scheme development / spectroscopy to address or identify unexpected sources of background.

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Any questions / objections?

Worst-case scenarios!

Scenario 1: Irrecoverable failure of the Rilis Machine Protection System on Friday evening at 10pm

RILIS members:
Dima (on-call), Camilo (back-up), Bruce (gone away for the weekend but not absent from CERN), all other RILIS team members (at a conference).

Consequence: RILIS cannot be safely operated in on-call mode.

Solution: Dima and Camilo switch to shift-mode and RILIS cannot be operated at night (00:00—> 08:00)
Monday morning: EN-STI-ECE come to try to fix the machine protection system

Scenario 2: Failure of TiSa Pump laser on Friday evening at 10pm. No TiSa specialist available to swap pump lasers.

RILIS members:
Dima (on-call), Pierre (back-up), all other RILIS team are away and not contactable for the weekend.

Consequence: No laser ions, Run is not able to continue

Solution: Run is postponed until the pump laser can be exchanged and the TiSa is realigned (Monday afternoon).

From last ISCC / GUI:
Suggestions were proposed for addressing RILIS manpower issues

1) Ask laser-proficient ISOLDE physicists to help out

2) Make use of a temporary (<6 month) trainees / visiting scientists (such as a ESR secondment) to support RILIS operation

~~**1)** Ask laser-proficient ISOLDE physicists to help out~~

~~**2)** Make use of a temporary (<6month) trainee / visiting scientist (such as a ESR secondment) to support RILIS operation~~

Neither of these options is feasible
from either a **safety** or **practical** point of view

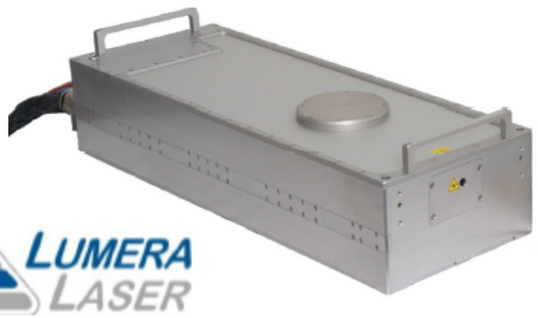
The training time devoted to establish a suitable level of competency is too high to enable a net gain in manpower when training very temporary RILIS personnel

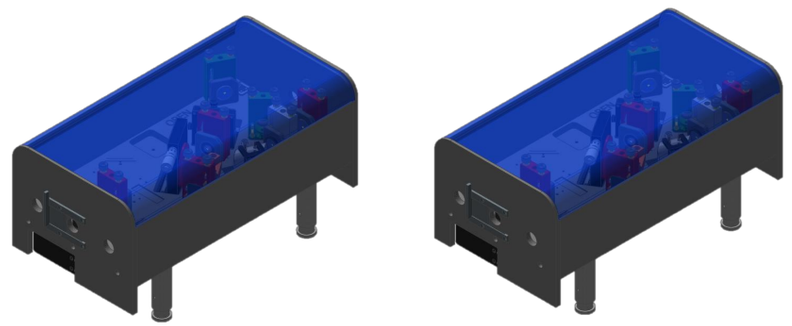
Some practical solutions being implemented

3) RILIS hardware consolidation for improved reliability

Consolidation budget from EN-Dept:
280 kCHF is being used

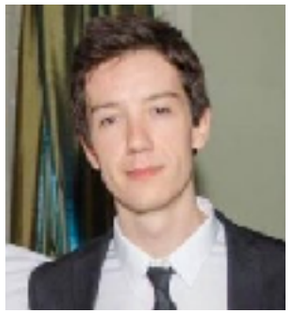
- RILIS dye pump laser replacement in 2017
- Spare BLAZE laser in 2017 (delivery July)
- 2 new TiSa cavities delivered





Some practical solutions being implemented

4) Maintain the 2nd CERN Fellow post (LA^{3}NET)



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In time for the 2018 operating period we will have 4 experienced RILIS team members