Low-energy *in-vitro* end station

Capture and energy selection

Target room

Laser room

Fixed field accelerator (FFA) ring

High-energy *in-vitro* end station

In-vivo end station

LhARA

Laser-hybrid Accelerator for Radiobiological Applications

LhARA- Baseline

https://ccap.hep.ph.ic.ac.uk/trac/raw-attachment/wiki/Communication/Notes/CCAP-TN-11-LhARA-Design-Baseline.pdf

This document defines all LhARA parameters.

Variation/change occurs through discussion at Collaboration meetings

Deliverables

Task Name	Work Package	Start	Finish
Year 1&2	**WP1**	**Thu 23/03/23**	**Thu 19/09/24**
Early Progress Review CDR	**WP1**	**Thu 23/03/23**	**Thu 23/03/23**
Interim Progress Review CDR	**WP1**	**Thu 21/09/23**	**Thu 21/09/23**
Pre-CDR Review	**WP1**	**Thu 21/03/24**	**Thu 21/03/24**
CDR	**WP1**	**Thu 19/09/24**	**Thu 19/09/24**

Task	WP	Start	Finish
Project Deliverables	WP1	Sat 01/10/22	Thu 19/09/24
Year 1&2	WP1	Thu 23/03/23	Thu 19/09/24
Early Progress Review CDR	WP1	Thu 23/03/23	Thu 23/03/23
Interim Progress Review CDR	WP1	Thu 21/09/23	Thu 21/09/23
Pre-CDR Review	WP1	Thu 21/03/24	Thu 21/03/24
CDR	WP1	Thu 19/09/24	Thu 19/09/24
Year 3-5	WP1	Sat 01/10/22	Sat 01/10/22
Tasks	WP1	Sat 01/10/22	Thu 30/09/27
Task1 : LhARA Project Management - monitoring c	WP1	Sat 01/10/22	Thu 30/09/27
Internal Reporting / input to LhARA progress reports	WP1	Fri 14/10/22	Wed 15/09/27
Year 1&2		Thu 09/03/23	Thu 05/09/24
Internal Reporting / input to LhARA (		Thu 09/03/23	Thu 09/03/23
Internal Reporting / input to LhARA (		Thu 07/09/23	Thu 07/09/23
Internal Reporting / input to LhARA (		Thu 07/03/24	Thu 07/03/24
Internal Reporting / input to LhARA (		Thu 05/09/24	Thu 05/09/24
Year 3-5		Fri 04/04/25	Wed 15/09/27
LhARA Collaboration meetings		Fri 14/10/22	Thu 01/07/27
Years 1&2		Fri 14/10/22	Wed 11/09/24
Collaboration meeting 1 - Kick-off		Fri 14/10/22	Fri 14/10/22
Collaboration Meeting 2		Wed 15/03/23	Wed 15/03/23
Collaboration Meeting 3		Wed 13/09/23	Wed 13/09/23
Collaboration Meeting 4		Wed 13/03/24	Wed 13/03/24
Collaboration Meeting 5		Wed 11/09/24	Wed 11/09/24

Collaboration meetings

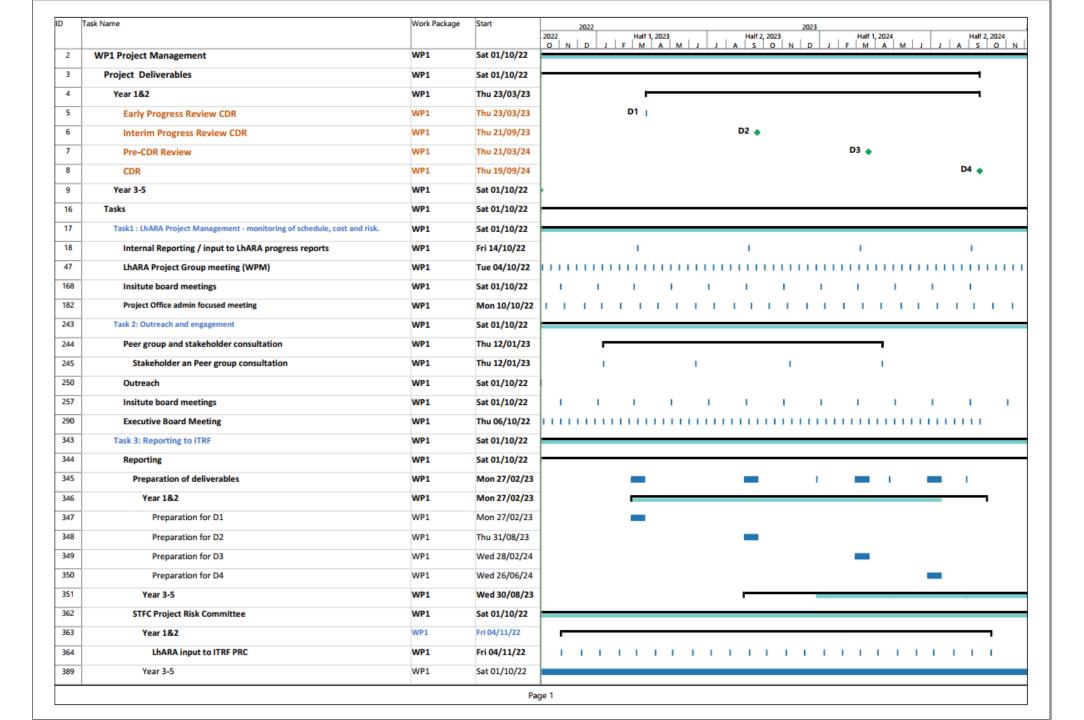| Task Name	Work Package	Start	Finish
Years 1&2		**Fri 14/10/22**	**Wed 11/09/24**
Collaboration meeting 1 - Kick-off		Fri 14/10/22	Fri 14/10/22
Collaboration Meeting 2		Wed 15/03/23	Wed 15/03/23
Collaboration Meeting 3		Wed 13/09/23	Wed 13/09/23
Collaboration Meeting 4		Wed 13/03/24	Wed 13/03/24
Collaboration Meeting 5		Wed 11/09/24	Wed 11/09/24

M5.1. Initial report on the user requirements for the in-vitro and in-vivo end stations.	WP5	Fri 31/03/23	Fri 31/03/23	
M3.1 Validate plasma simulations with existing Swansea experimental set-up	WP3	Mon 03/04/23	Mon 03/04/23	
M6.1: Early review of R&D work towards LhARA CDR (6 months)	WP6	Mon 03/04/23	Mon 03/04/23	
M5.2. Report on the beam-monitoring technology for LhARA.	WP5	Fri 29/09/23	Fri 29/09/23	
M2.1: Prediction of optimised proton source parameters for 100+ TW laser systems based on hydrodynamic and kinetic simulations	WP2	Sun 01/10/23	Sun 01/10/23	
M6.2: Interim review of R&D work towards LhARA CDR (12 months)	WP6	Mon 02/10/23	Mon 02/10/23	
M2.2: First SCAPA ion source simulations and experiment completed.	WP2	Mon 01/04/24	Mon 01/04/24	
M5.3. Second report on the user requirements for the in-vitro and in-vivo end stations.	WP5	Sat 30/03/24	Sat 30/03/24	
M3.2 Progress report of large diameter plasma experiments and simulations	WP3	Mon 01/04/24	Mon 01/04/24	
M6.3: Final review of R&D work towards LhARA CDR (18 months)	WP6	Tue 02/04/24	Tue 02/04/24	
M4.1 Geant4 simulations of beam energy deposition profile	WP4	Mon 01/04/24	Mon 01/04/24	
M3.3 Next generation plasma lens testbench design	WP3	Mon 30/09/24	Mon 30/09/24	
M4.2 Acoustic sensor array design	WP4	Mon 30/09/24	Mon 30/09/24	

Monthly Report to PRC/IF

WPMs report to me

      LhARA reports to ITRF

            ITRF reports to DL

                  DL delivers overall report

One simple form addressing

- progress to date highlights, upcoming tasks

- Risk & Issues

- Spend – this will be linear for almost all Unis. Those with equipment/facilities may need to present that spend.

ID	Task Name	Work Package	Start
2	**WP1 Project Management**	WP1	Sat 01/10/22
3	**Project Deliverables**	WP1	Sat 01/10/22
4	**Year 1&2**	WP1	Thu 23/03/23
5	Early Progress Review CDR	WP1	Thu 23/03/23
6	Interim Progress Review CDR	WP1	Thu 21/09/23
7	Pre-CDR Review	WP1	Thu 21/03/24
8	CDR	WP1	Thu 19/09/24
9	**Year 3-5**	WP1	Sat 01/10/22
16	Tasks	WP1	Sat 01/10/22
17	Task1 : LhARA Project Management - monitoring of schedule, cost and risk.	WP1	Sat 01/10/22
18	**Internal Reporting / input to LhARA progress reports**	WP1	Fri 14/10/22
47	**LhARA Project Group meeting (WPM)**	WP1	Tue 04/10/22
168	**Insitute board meetings**	WP1	Sat 01/10/22
182	**Project Office admin focused meeting**	WP1	Mon 10/10/22
243	Task 2: Outreach and engagement	WP1	Sat 01/10/22
244	**Peer group and stakeholder consultation**	WP1	Thu 12/01/23
245	**Stakeholder an Peer group consultation**	WP1	Thu 12/01/23
250	**Outreach**	WP1	Sat 01/10/22
257	**Insitute board meetings**	WP1	Sat 01/10/22
290	**Executive Board Meeting**	WP1	Thu 06/10/22
343	Task 3: Reporting to ITRF	WP1	Sat 01/10/22
344	**Reporting**	WP1	Sat 01/10/22
345	**Preparation of deliverables**	WP1	Mon 27/02/23
346	**Year 1&2**	WP1	Mon 27/02/23
347	Preparation for D1	WP1	Mon 27/02/23
348	Preparation for D2	WP1	Thu 31/08/23
349	Preparation for D3	WP1	Wed 28/02/24
350	Preparation for D4	WP1	Wed 26/06/24
351	**Year 3-5**	WP1	Wed 30/08/23
362	**STFC Project Risk Committee**	WP1	Sat 01/10/22
363	**Year 1&2**	WP1	Fri 04/11/22
364	LhARA input to ITRF PRC	WP1	Fri 04/11/22
389	Year 3-5	WP1	Sat 01/10/22

Project Structure

WP1 will organise

- Collaboration meetings, project office.
- Deliverables, reporting to ITRF
- Outreach, Institute and Executive Board meetings
  - All goes on the Wiki.
- Bi-weekly WPM meeting.
- Bi-weekly Consortium meeting

WPMs to organise:

- Meetings on 2 weekly basis (or more often if you need it)
  - Agenda on Wiki – advertise time and date to Collaboration
  - Minutes on Wiki

LhARA Wiki

- Research/DesignStudy/ITRF/Documents/PA1
- Research/DesignStudy/ITRF/Documents/PA2?
- Research/DesignStudy/ITRF/Documents/Construction?

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- Research/DesignStudy/ITRF/Documents/PA1/WP1.1 LhARA Project management
- Research/DesignStudy/ITRF/Documents/PA1/WP1.2 Laser driven proton and ion source
- Research/DesignStudy/ITRF/Documents/PA1/WP1.3 Proton and ion capture
- Research/DesignStudy/ITRF/Documents/PA1/WP1.4 Ion-acoustic dose mapping
- Research/DesignStudy/ITRF/Documents/PA1/WP1.5 Novel end-station development
- Research/DesignStudy/ITRF/Documents/PA1/WP1.6 Design and Integration
- (wp0) ITRF Project Mangement
- Research/DesignStudy/ITRF/Documents/PA1/wp2 ITRF Facilities and Costing work package management
- Research/DesignStudy/ITRF/Documents/PA1/wp3 Conventional Technology work package management
- Research/DesignStudy/ITRF/Documents/PA1/she? Safety Health and Environment
- Research/DesignStudy/ITRF/Documents/PA1/CERN? CERN
- Research/DesignStudy/ITRF/Documents/PA1/ac Advisory Committee
- Research/DesignStudy/ITRF/Documents/PA1/Para? LhARA Parameters
- Research/DesignStudy/ITRF/Documents/PA1/CDR? Conceptual Design Review
- Research/DesignStudy/ITRF/Documents/PA1/ITRF? Documents copied to ITRF Server

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By Edgewall Software.

- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/agn Agendas
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/cal? Calculations
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/code? computer program/code/source etc.
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/dsn? Design Notes
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/dwg? Drawings
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/est? Estimates
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/fig? Figures
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/fin? Finance
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/fea? Finite Element Analysis
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/form? Forms and templates
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/min? Minutes
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/misc? Miscellaneous
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/news? Bulletins/newsletters
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/pho? Photographs
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/pmp? Project plans
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/proc? Procurement
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/prop? Proposals
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/prs? Presentations
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/ppl? Project plans (schedules)
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/press? Press notes
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/qual? Quality Assurance
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/ref? Referecen documentation
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/res? Resources
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/rev? reviews
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/risk? risk management
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/rpt Reports
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/sch? schematics
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/spec? Specifications
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/str? Strategy
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/tbl? Table
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/tn? Technical Note
- Research/DesignStudy/ITRF/Documents/PA1/WP1.1/tend? Tender Documentation

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2nd Stage – Preliminary Activity 2

- Preparation ~ 18 month point
- Match to known 'bid opportunities'
- Account for delay between proposal submission and receipt of funds

LhARA Review

Review of the collaboration's "R&D proposal for the preliminary and pre-construction phases"

Review panel

The review is being organised under the auspices of the CCAP International Advisory Board. The review panel is made up of the CCP IAB Board:

- ➥ Mile Lamont (CERN) (Chair);
- ➥ Michael Baumann (DKFZ);
- ➥ Paul Bolton (LMU);
- ➥ Brita Singers Sørensen (Aarhus); and

Expert reviewers:

Gianluigi Arduini (CERN)
Christian Carli (CERN)
➥ Malek Haj-Tahar (PSI)

Terms of reference

Terms of reference

Meetings

Next meeting:

26/27 October 2022

30Aug22:

➥ https://indico.cern.ch/event/1194925/ (Access code: CCAP3008)
02Sep22: Preliminary notes prepared by KL following a meeting with G.Arduini and P.Bolton to consider the next steps in the review.

1st session – 30th August 2022

2nd, 3rd sessions 26th and 27th October

https://ccap.hep.ph.ic.ac.uk/trac/wiki/Research/DesignStudy/Reviews/AugSep22/Review