OLYMPUS Meeting at DESY

Monday 28 June, Building 66

- 09:00 - Welcome and agenda - Hasell
- 09:15 - Monte Carlo - Hasell
- 09:30 - Collimator update - Schmidt
- 10:00 - Symmetric Möller - Diefenbach
- 10:30 - Coffee
- 10:45 - Wire chamber - Hasell
- 11:00 - TOF - Lehmann
- 11:15 - Symmetric Möller - Rodriguez
- 11:30 - MWPC - Kisselev
- 12:00 - Lunch
- 13:45 - Logo - Hasell
- 14:00 - Luminosity monitor - Kohl
- 14:15 - GEM readout - Frullani
- 14:30 - WC electronics - Winnebeck
- 14:45 - Schedule - Schneekloth
- 15:00 - Status of funding
- 15:30 - Coffee
- 16:00 - Meeting with directorate
- 16:30 - TDR - Milner
- 16:45 - DAQ - Funke
- 17:00 - HV slow control - Izotov
- 17:15 - Test experiment - Bernauer

Tuesday 29 June, Building 66

- 09:00 - Specialist discussions - TBA
- 09:15 -
- 09:30 -
- 09:45 -
- 10:00 - Computer registration - Wuensch
- 10:30 - Coffee
- 10:45 - Safety lecture - Schneekloth
- 11:15 -
- 11:30 -
- 12:00 - Lunch
- 13:30 -
- 14:00 - DORIS Hall - Hauschildt
- 14:30 - Target chamber, … - Kelsey
- 15:00 - Target cell, Wakefield - Kelsey
- 15:30 - Coffee
- 15:45 - Beam lifetime - Tschälar
- 16:15 - DORIS ring - Brinker
- 16:45 - Next meeting, logo, AOB - Hasell

Extracurricular Activities

Monday, 28 June - outside guest house 3

- BBQ
- some food and drink provided
  - request 5 € to Doug Hasell or Jan Bernauer
- free to bring more food to BBQ or drink

Tuesday, 29 June

- Harbour tour
  - narrated by Jan Hauschildt
  - 20 € to Jan Hauschildt
  - Hafentor, this is 100 m from S-Bahn Landungsbrücken
    - S1 to Landungsbrücken
  - shoreside of the tallship "Rickmer Rickmers" (not down on the pontoons !!).
  - may be cool on the water

- Dinner
  - TBA

OLYMPUS Monte Carlo

Monte Carlo

- not much changed since last meeting
- currently at revision 112
  - small improvements
- need manpower to work on coding
  - path forward is clear but need manpower and time
  - will assign some tasks to MIT students
  - need further effort
- volunteers ?
  - reconstruction
  - MWPC
  - generators
  - detailed simmulation of detector response

Obtaining Latest Version

SVN repository on LNS computer

- username@gem2d.lns.mit.edu/Users/olympus/SVN/MC/trunk

Access repository via ssh

- svn checkout svn+ssh://username@gem2d.lns.mit.edu/Users/olympus/SVN/MC/trunk
- will ask for your password (maybe twice)
- will create a directory “trunk” in your current directory
- type the following:
  - cd trunk
  - make
  - OLYMPUS (for interactive display)
  - OLYMPUS Batch.mac (for batch running)

SVN remembers where the repository is

- when in “trunk” directory
- just type “svn update” or “svn stat”

Subversion

Code management system

- version control with trunk, branches, and tags

For most users

- svn checkout …/trunk
  - compile, run, analyse results
  - change run parameters interactively or in macro files DO NOT upload changes
- svn update
  - periodically to get latest revisions

For programmers

- svn checkout …/trunk
  - edit and test code
- svn stat
  - frequently compare with version in repository
- svn update
  - frequently get latest revisions, merge with local changes, test thoroughly
- svn commit -m “Describe improvements made.”

Analysis

Each run produces the ROOT file “MCData.root”

ROOT file contains a TTree called “Tree”

Tree has branches for run, generator, and most detectors
- EV, MC, GT, WC, TF, LM

Each branch has various leaves
- MC.nMC - number of vertices, numbering starts at 0
- MC.ID[0] - id number for particle at vertex 0
- MC.x[1] - x position of vertex 1
- GT.xl[3] - local (GT frame) x coordinate for fourth hit

ROOT session
- .L libData.so;
- TFile f(“MCData.root”);
- Tree.Draw(“GT.xl[0]:MC.px[0]”);

ROOT Integration

OYMPUS Monte Carlo output classes are TObjects

- i.e. ROOT knows what is inside - creates dictionary
- Dump, Inspect, etc.

Has advantages

- define root functions inside Monte Carlo
  - MC.P(0) - rather than sqrt(MC.px[0]*MC.px[0]+MC.py[0]*MC.py[0]+ …)
- use TTreeBowser
- MakeClass
  - automatic generation of C++ analysis class

Complicates the compile and make

- not in current version of GNUmakefile
  - Luigi Capozza, Mainz has written a make file but not implimented yet

Documentation

Doxygen

- automated documentation system
- works on even undocumented files
  - but information very basic
- with a little care in documenting the code
  - very useful and full documentation
- HTML and LaTeX output
- current Monte Carlo documentation on OLYMPUS web page

OLYMPUS Monte Carlo mailing list

- olympus-mc@mit.edu

OLYMPUS Wire Chambers

Preparations at MIT-Bates

- cables and electronics removed
- all wires stripped out
- feed-throughs removed
- crimped pins removed from feed-throughs
- insulators ultra-sonically cleaned
- packed and shipped to DESY

Thanks

- J. Kelsey, B. Buck, P. Goodwin, and MIT-Bates staff
- M. Steadman

OLYMPUS Wire Chambers

Wire Chambers and TOF

- crates delivered to TASSO hall
- unpacked wire chambers but had to wait for support frame
- moved TOF into TASSO control room

Re-wiring at DESY

- TASSO hall
- clean room

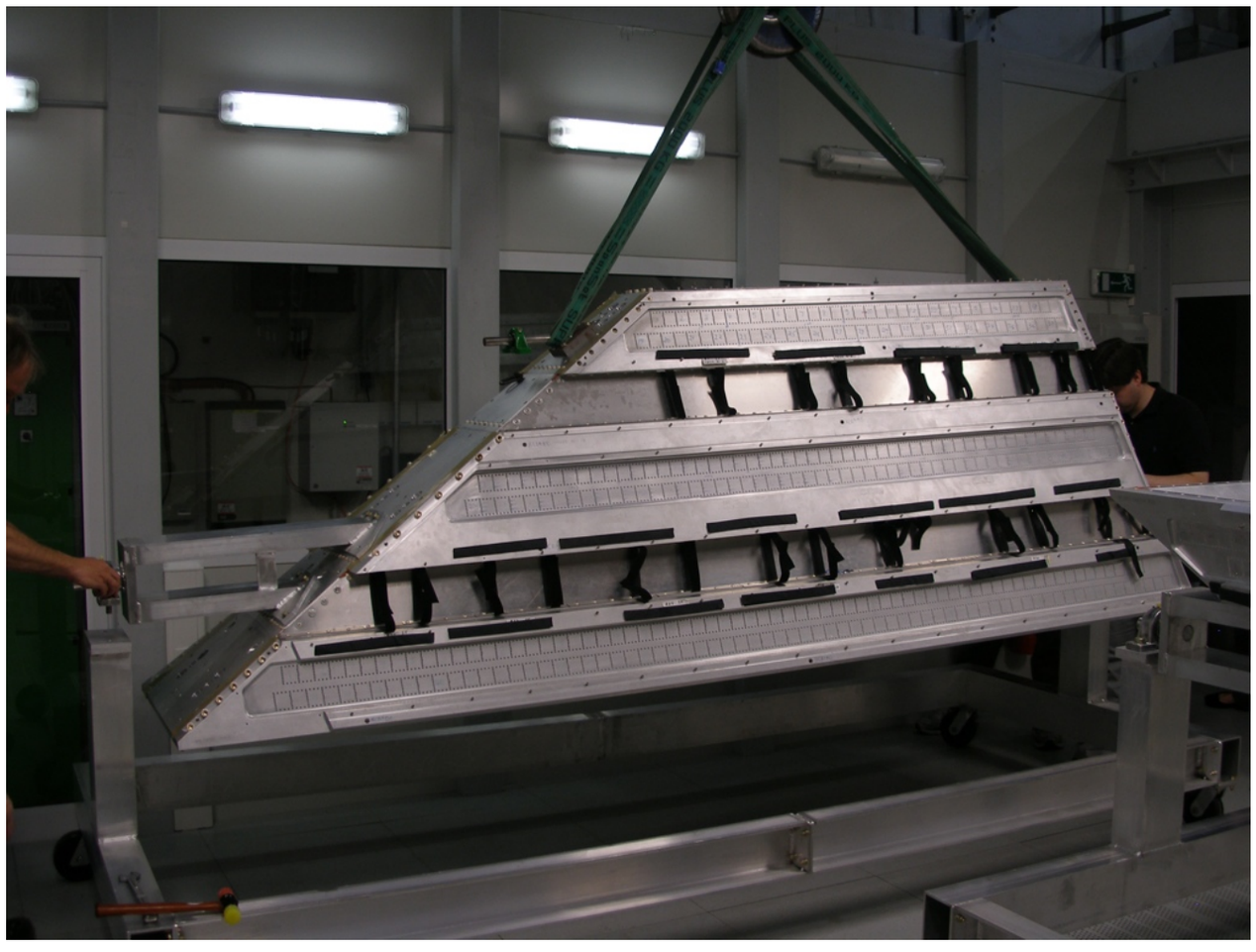
Thanks

- U. Schneekloth, J. Hauschildt
- DESY staff

OLYMPUS Wire Chambers

Wire chambers

- arrived DESY ~7/6
- waited for support frame ~24/6
  - slight adjustment needed
- support frame assembled
- WC craned into clean room
  - 25/6



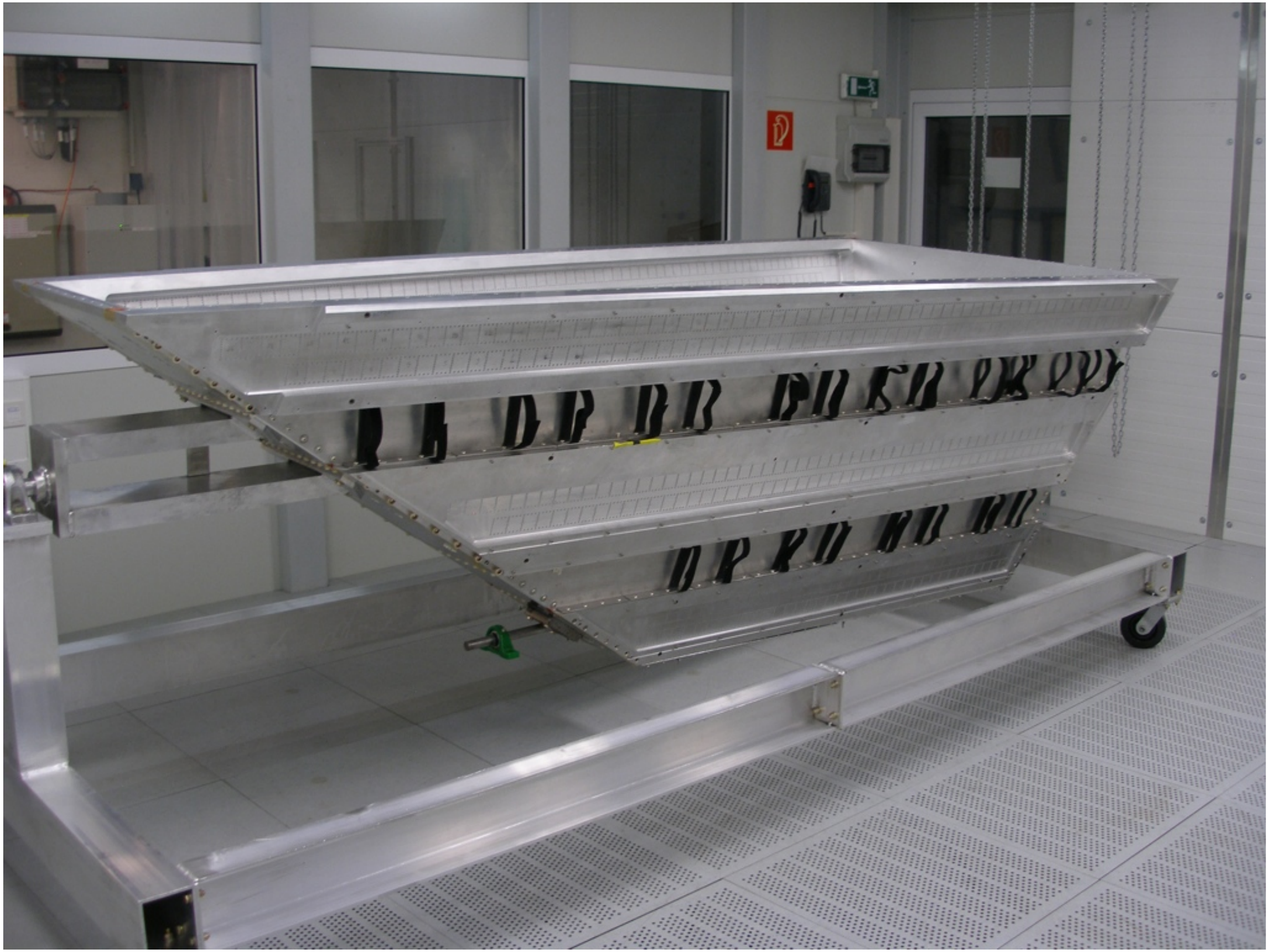
- Cleaning has begun

Thanks

- L. Ice, O. Mays, M. Steadman

OLYMPUS Wire Chambers

OLYMPUS Wire Chambers



OLYMPUS Wire Chambers

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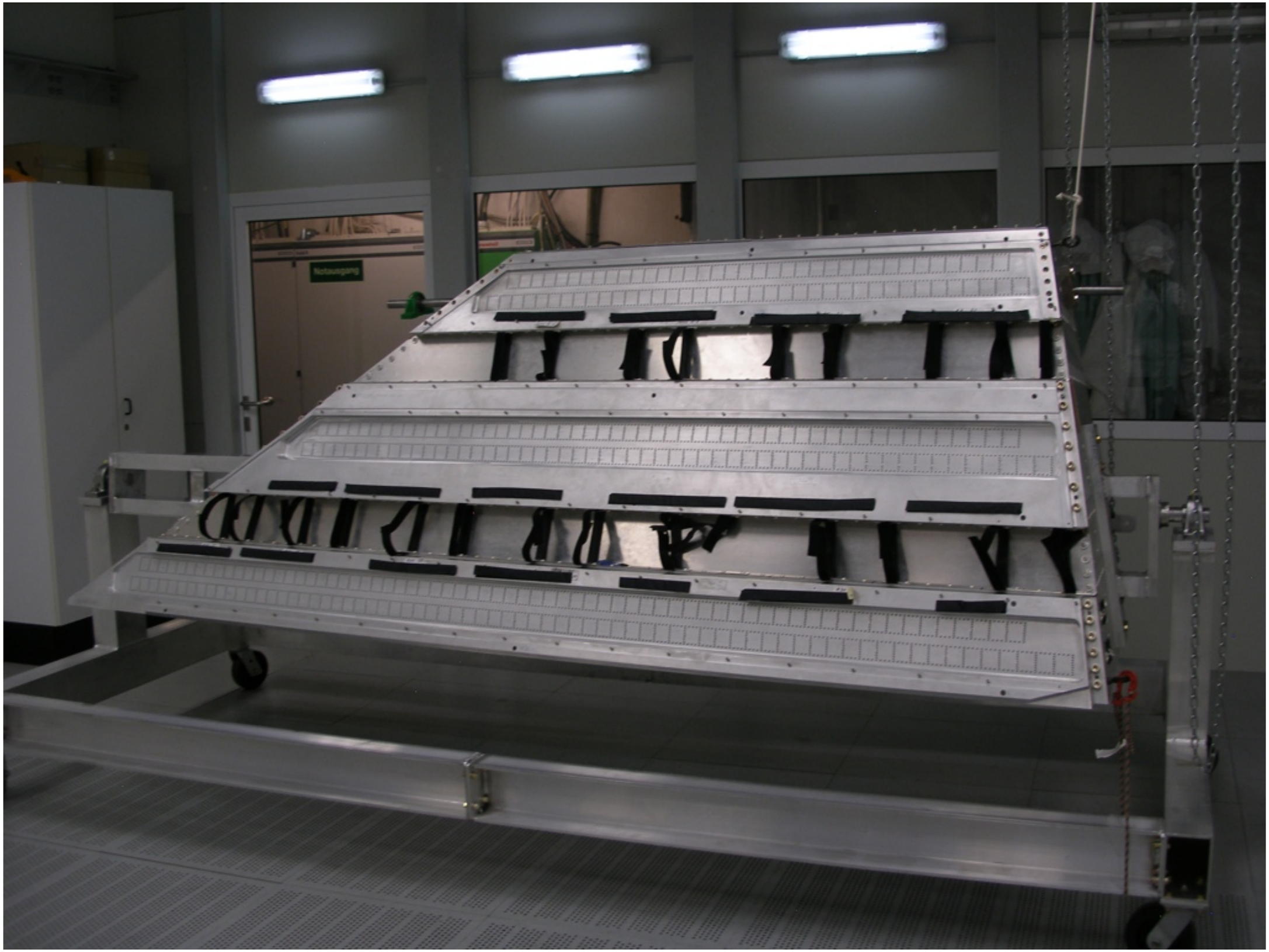


OLYMPUS Wire Chambers

Re-wiring Wire Chambers

Schedule

- clean wire chambers
  - next few days
- pre-tension with piano wire
  - 1 piano wire per drift cell
  - tension equivalent to wire load
  - 318 piano wires
  - acoustically tune tension
  - end of this week - early next week

Re-wire chambers

- 8,694 field wires
  - 100 - 150 μm OD BeCu wire
  - fairly easy to wire
  - 3’ / wire = 11 weeks
- 954 sense wires
  - 25 μm OD W(Re) wire
  - fairly difficult to wire
  - 10’ / wire = 4 weeks
- 2 teams in parallel = 8 weeks

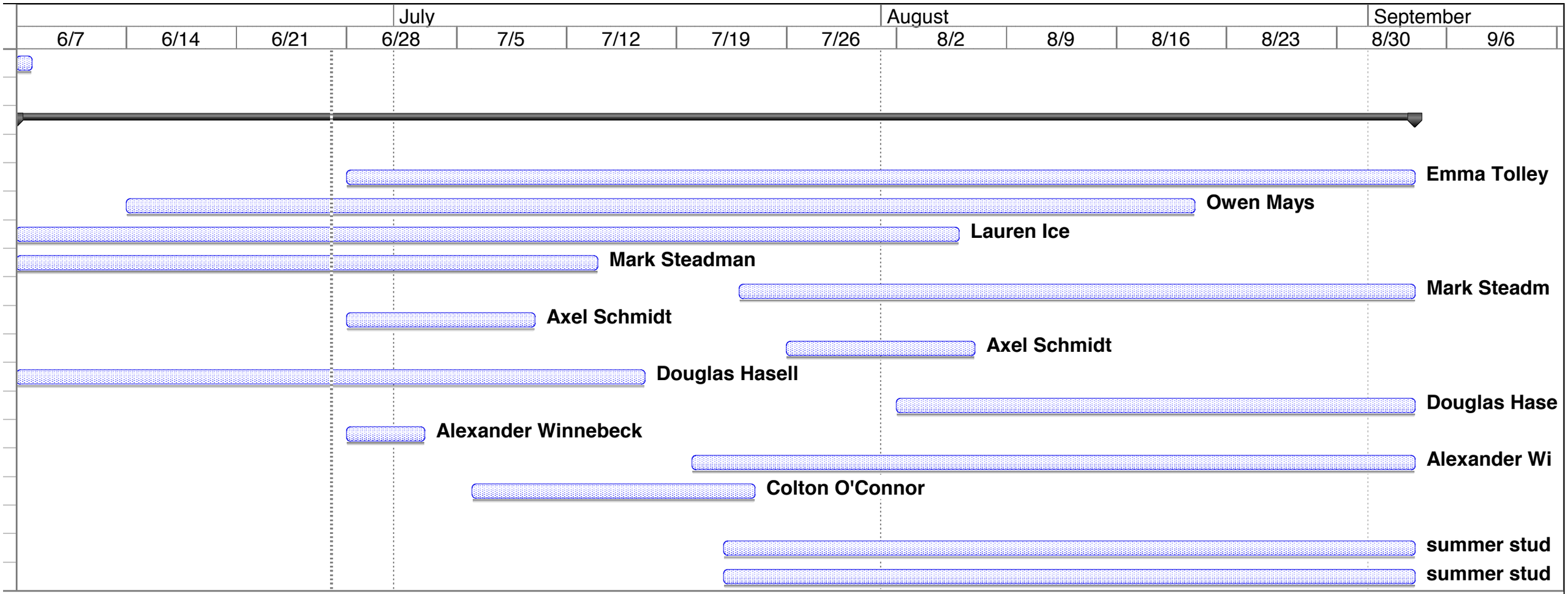
Manpower

- ASU graduate student
  - Lauren Ice
- MIT graduate students
  - Axel Schmidt
  - Colton O’Connor
- MIT undergraduates
  - Owen Mays
  - Emma Tolley
- MIT research assistant
  - Mark Steadman
- MIT post-docs
  - Alexander Winnebeck
  - Jan Bernauer
- German summer students
- Students from Bonn

Finish by September

- will be tight

Re-wiring Manpower



Wire Chamber Electronics

Upgrade front-end electronics

- keep existing amplifier/discriminator cards
- improve LV power distrbution
- improve cooling
- improve signal readout
- new HV distribution to simplify connections

More details in talk by Alexander Winnebeck this afternoon

Expect wire chambers to be ready for installation in November, 2010

OLYMPUS GEM Tracker

Conceptual design only at this stage

Using existing technology

Leveraging experience and resources from STAR FGT

STAR Forward GEM Tracking has

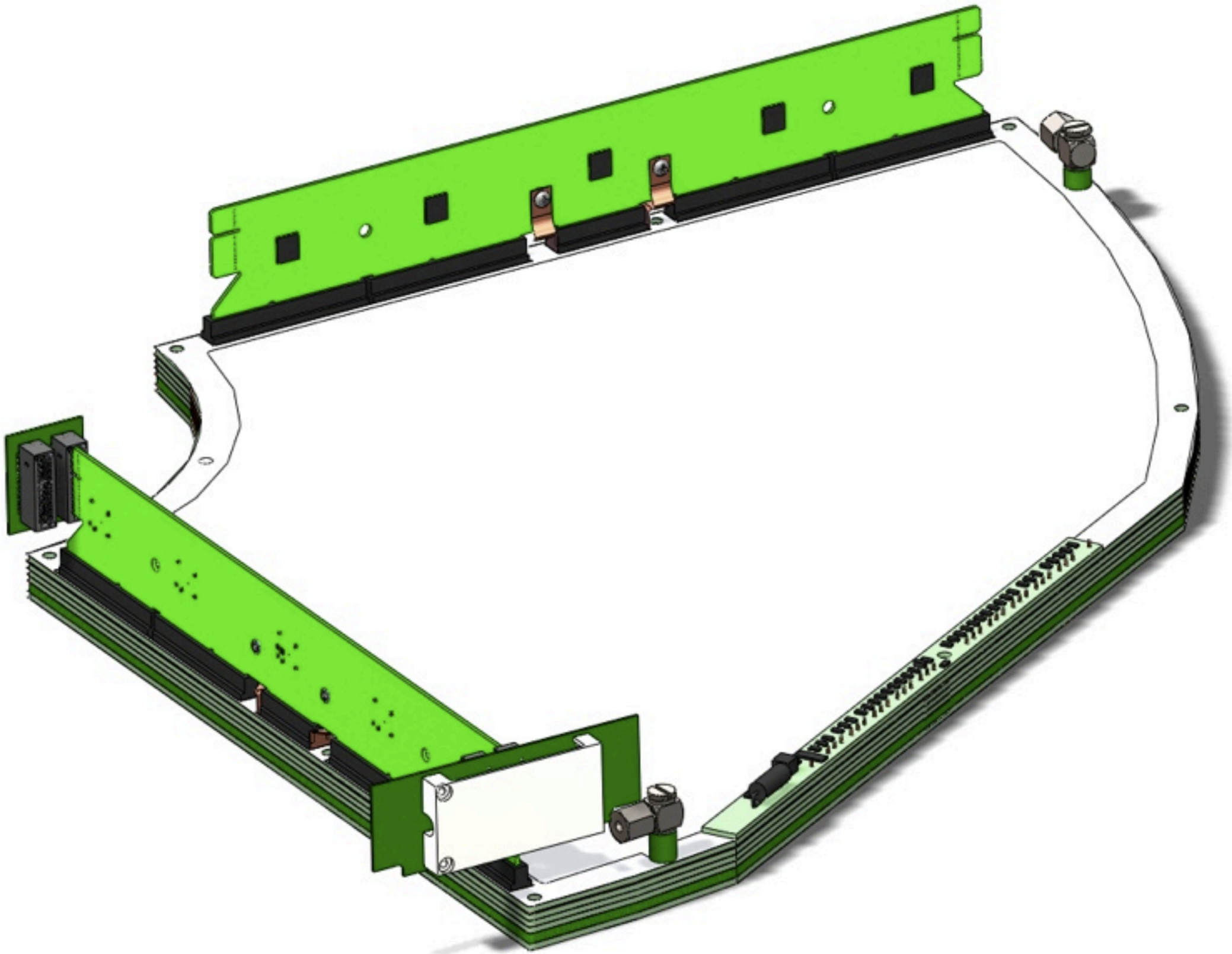
- 40 x 40 cm^2 GEM foils
- complicated 2D RΦ readout with changing pitch and line width
- very narrow frames to maximise active area
- electronics in shadow of narrow frame

OLYMPUS GT

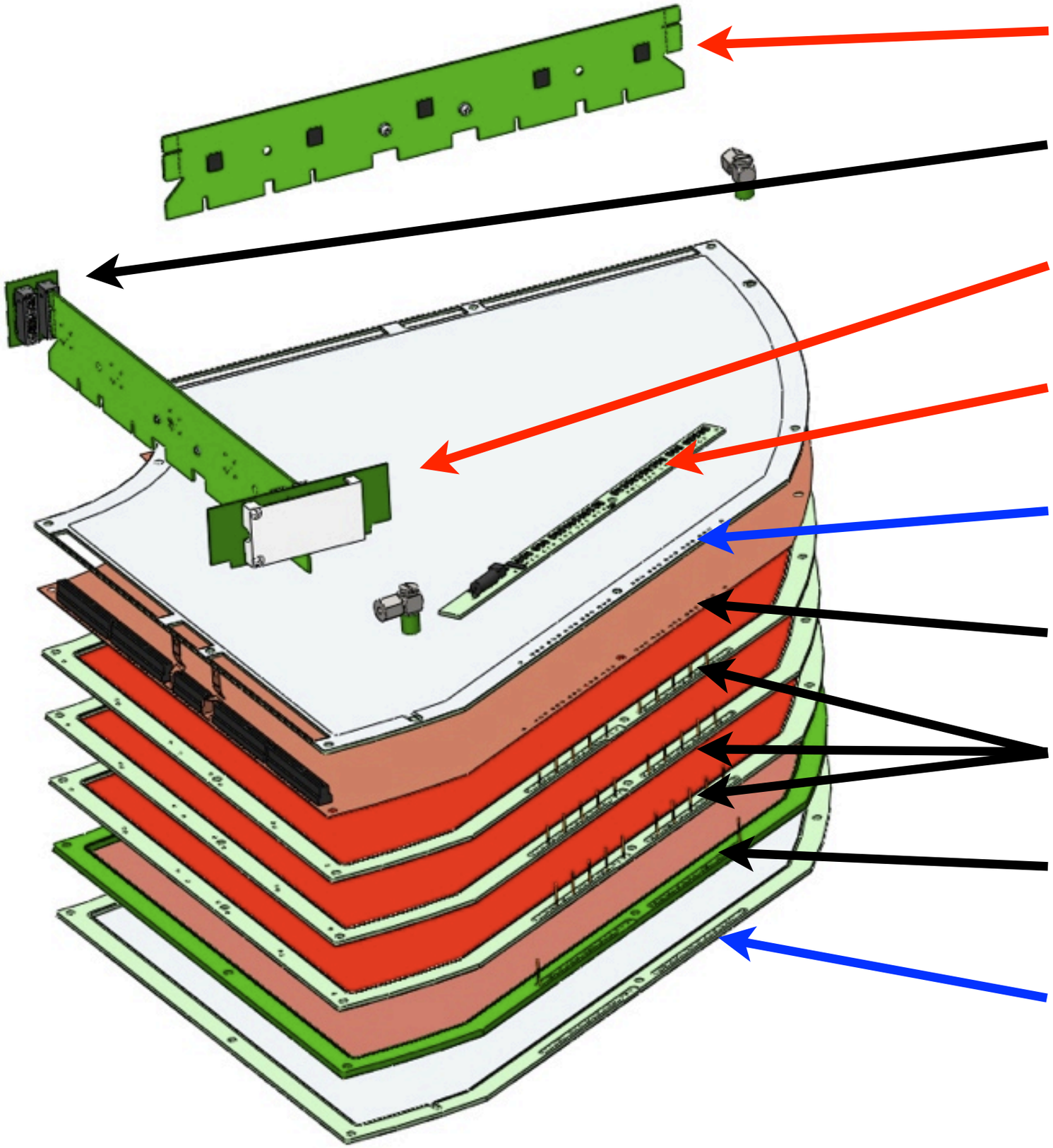
- 50 x 30 cm^2 GEM foils but ultimately 100 x 30 cm^2 detector
- straight forward 2D readout
- few restrictions on frame size

STAR FGT GEM Foil

STAR FGT GEM Quadrant



FGT Quadrant Components



- APV module
- Terminator board
- Inter-connect board
- HV distribution
- Gas volume layer
- Readout board
- GEM layers
- HV layer
- Gas volume layer

OLYMPUS GEM Tracker

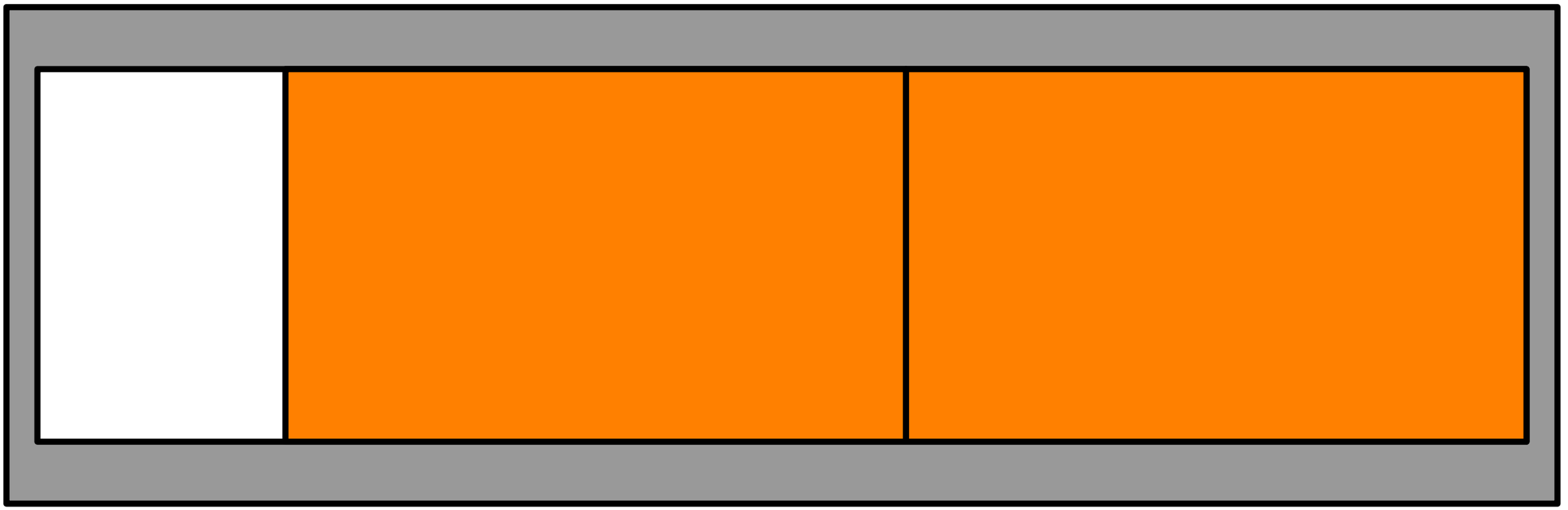
GEM foils

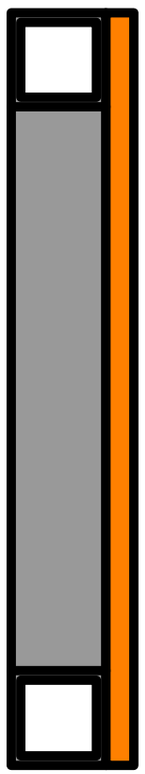
- CERN has single sided foils 200 x 50 cm^2
  - but we have no experience with single sided GEMs
- Tech-Etch local company near Boston, good relationship
  - can produce 56 x 50 cm^2 double-sided GEM foils
  - process has been optimised through work for STAR FGT

OLYMPUS GEM foils

- use two foils per layer, side by side or glued to minimise gap
- detectors vertical so flatness requires minimal tension
- frames can be wide to hold shape
  - can also have aluminium strong back

OLYMPUS GEM Tracker Concept





OLYMPUS GEM Tracker 2D Readout

Use line and pad design with vias

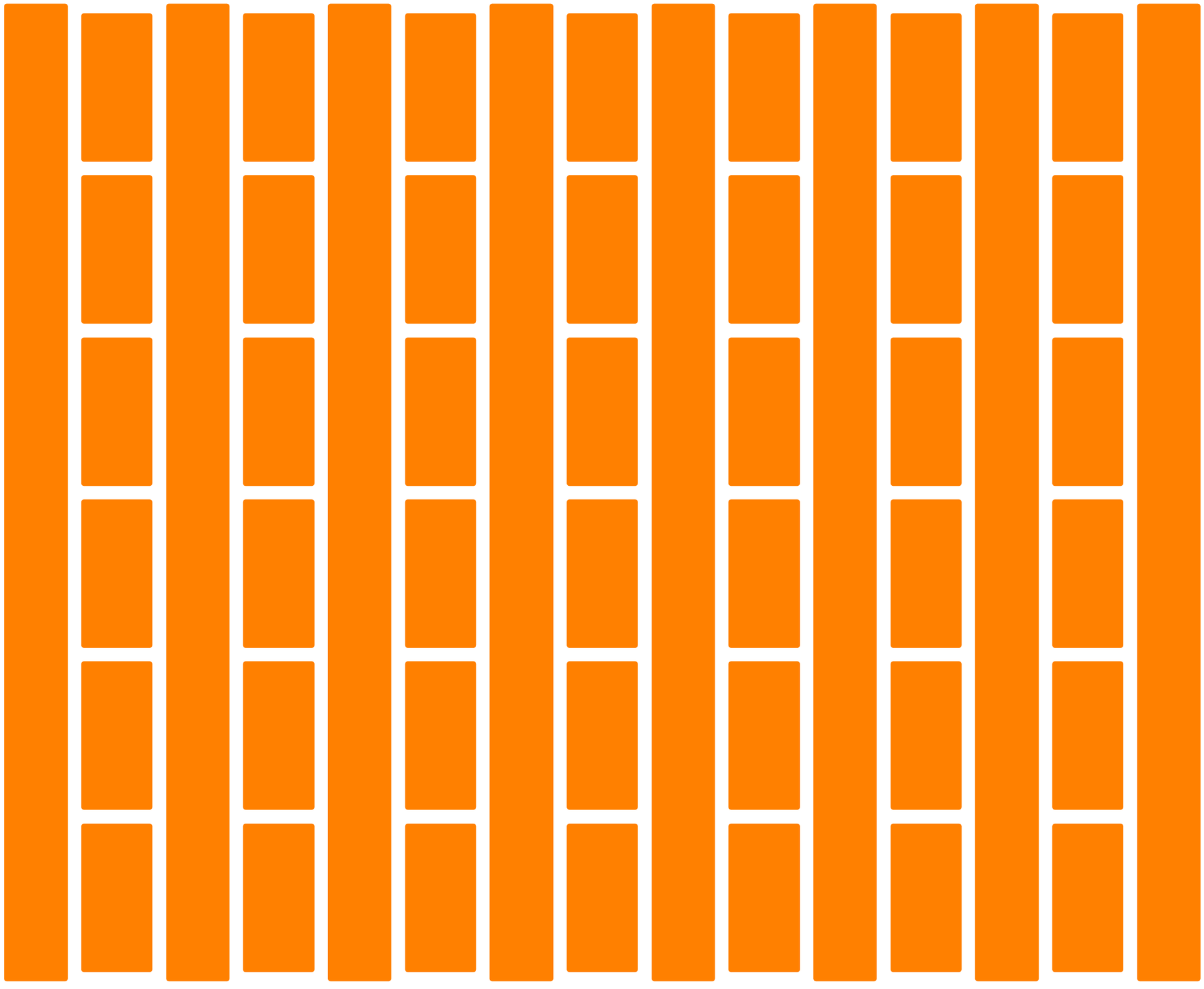
- vertical lines 182 μm wide, 600 μm pitch
- interleaved with pads 218 μm wide, 1000 μm high with 1200 μm pitch
- pads connected by vias into horizontal rows on back-side
  - vias 100 μm diameter with 400 μm pad on backside
- 100 μm gap between lines and pads
- ~2000 channels per GEM tracker
- lines and pads have equal area -> equal charge sharing
- expect x resolution < 100 μm and y resolution ~300 μm

Technology being developed at Tech-Etch and Compunetics

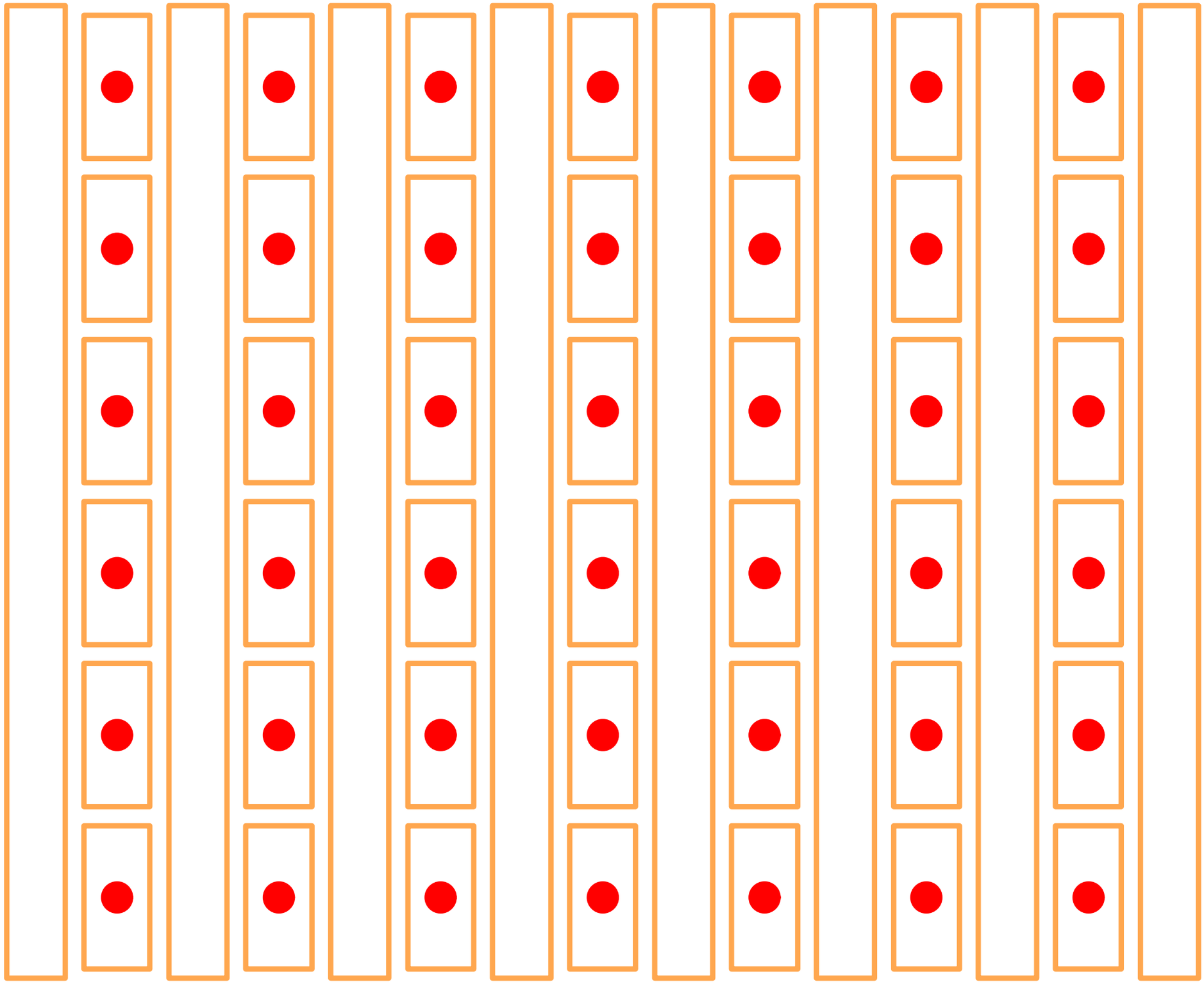
- different approaches
- cheaper than laser ablation and more reliable
- Tech-Etch already produced 2D readout boards with 300 μm pitch

Line and Pad 2D Readout Concept

Line and Pad 2D Readout Concept



Line and Pad 2D Readout Concept



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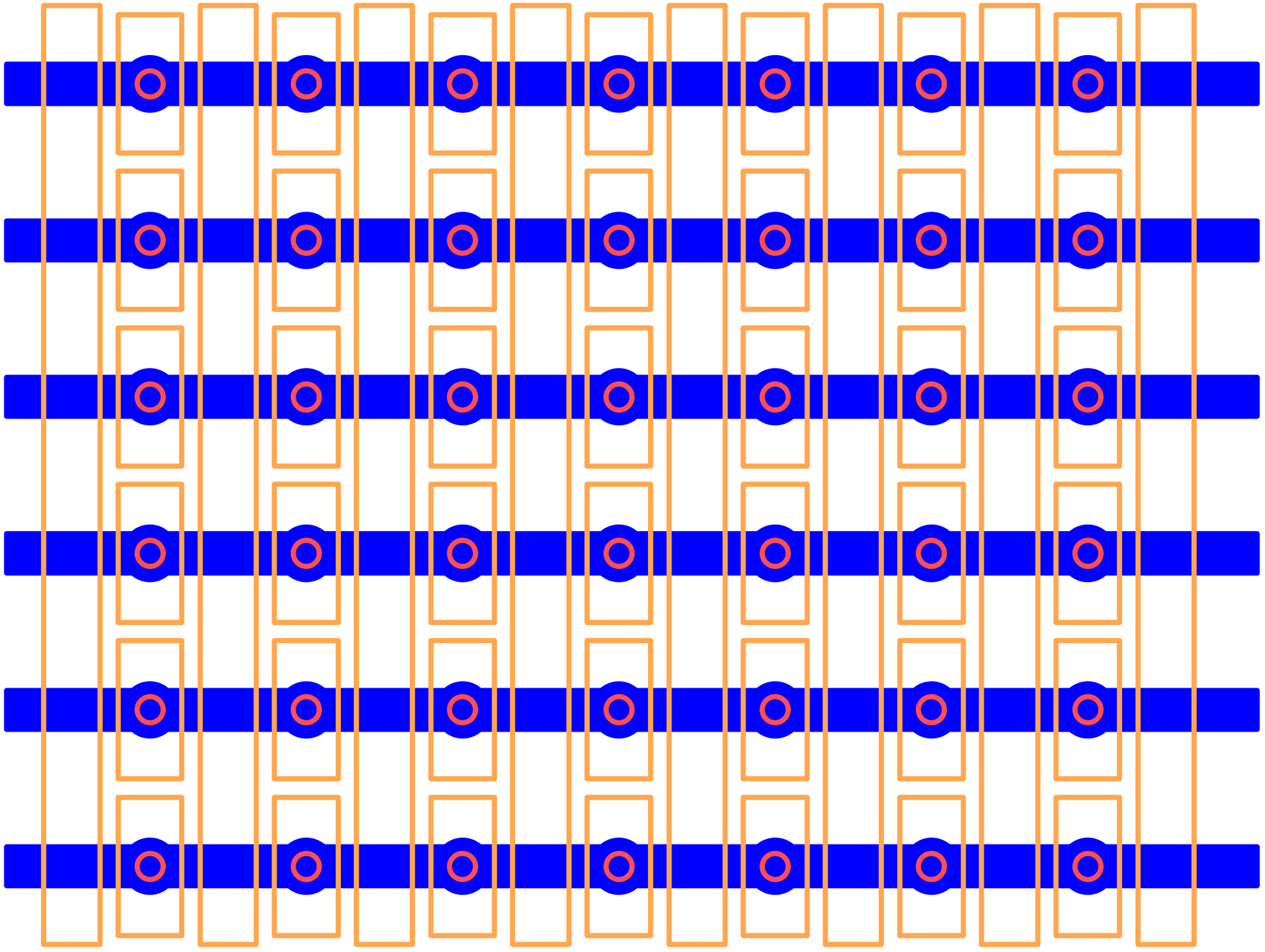
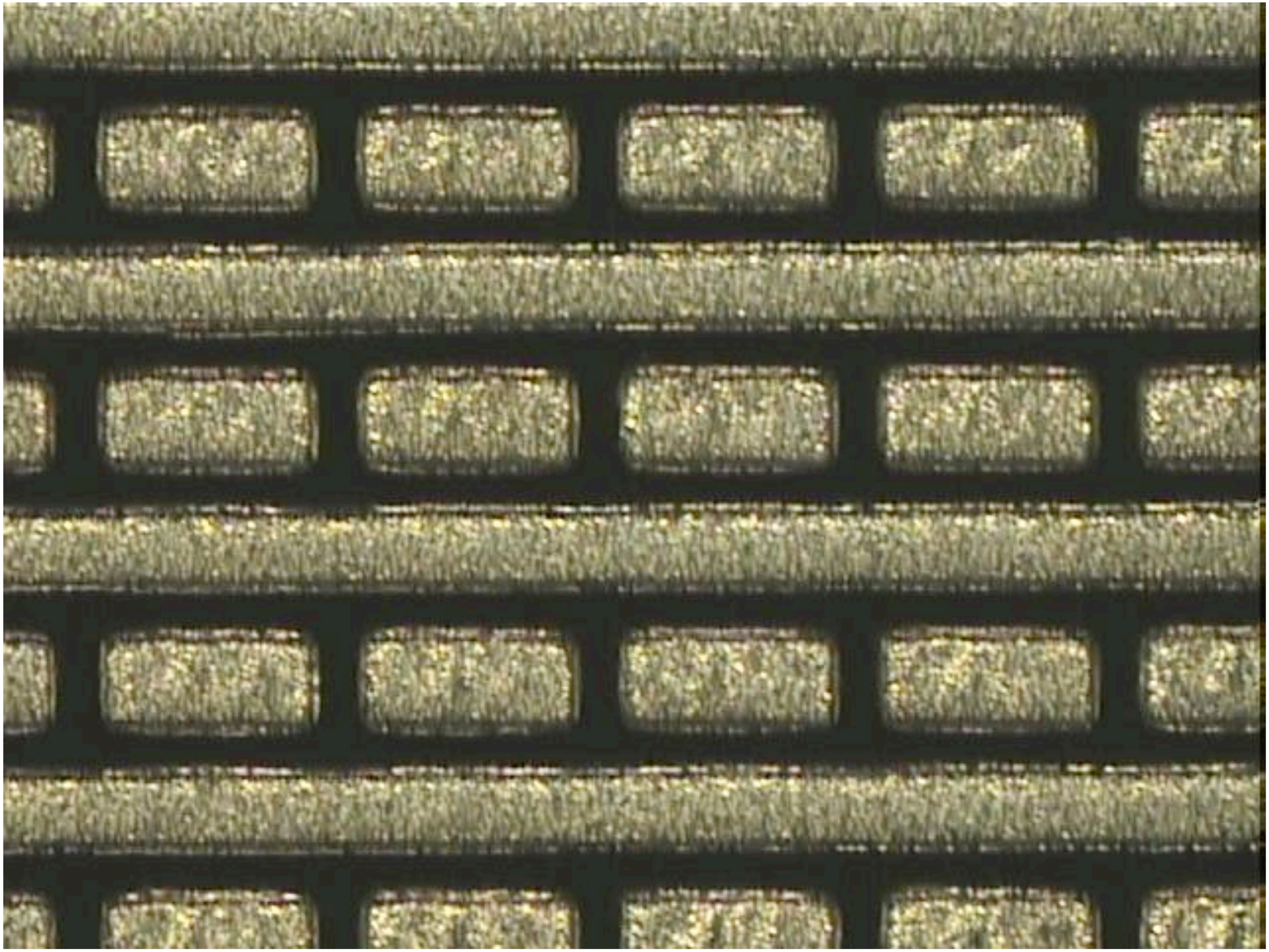


300 Micron Pitch Line and Pad Design



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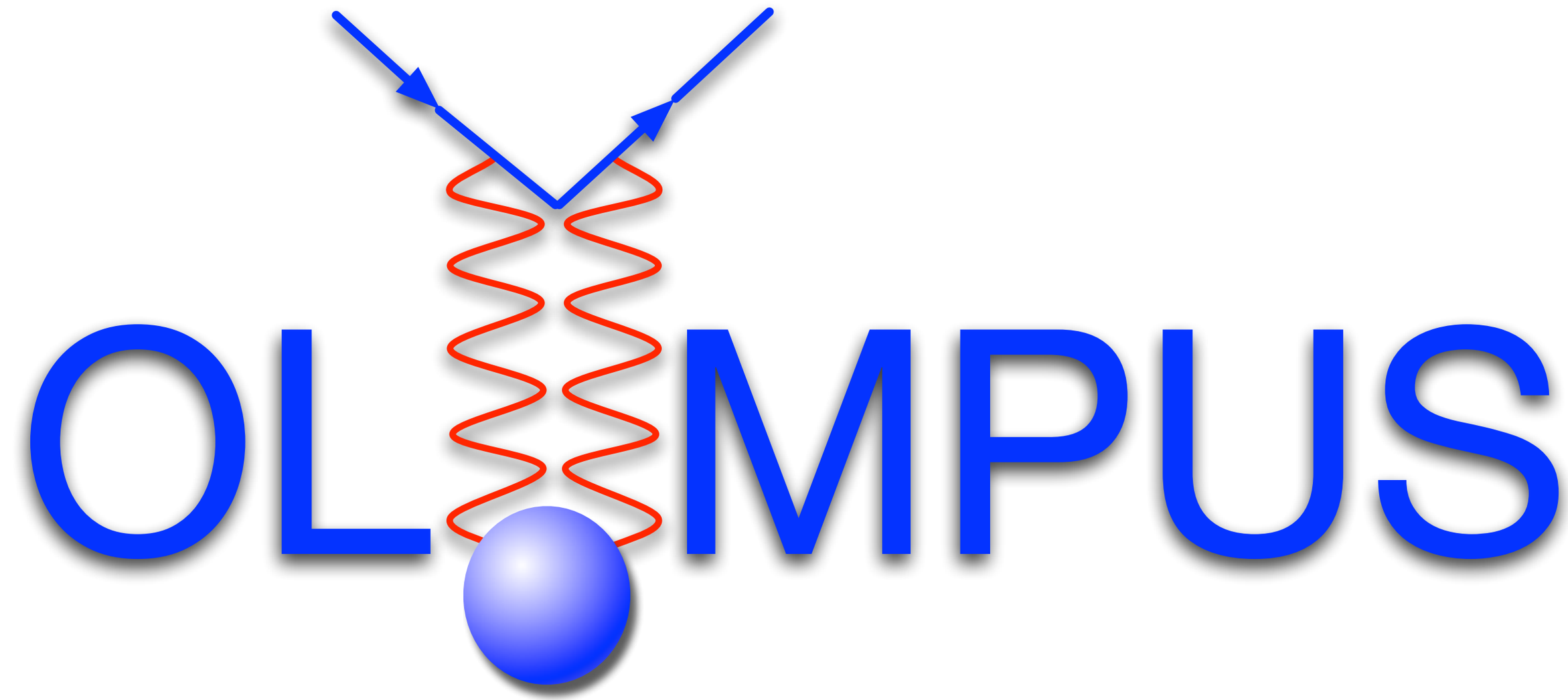
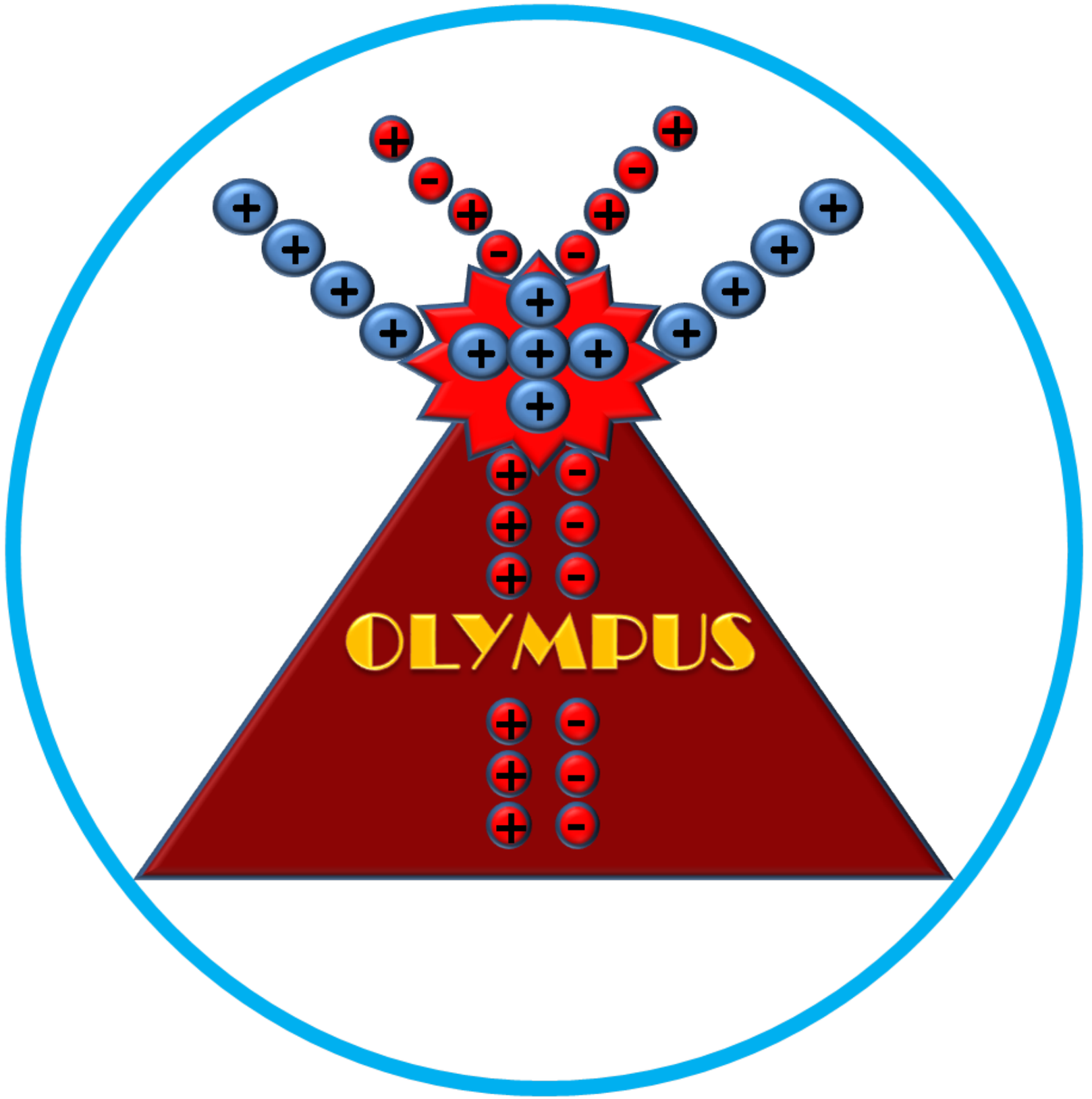
Logo 1

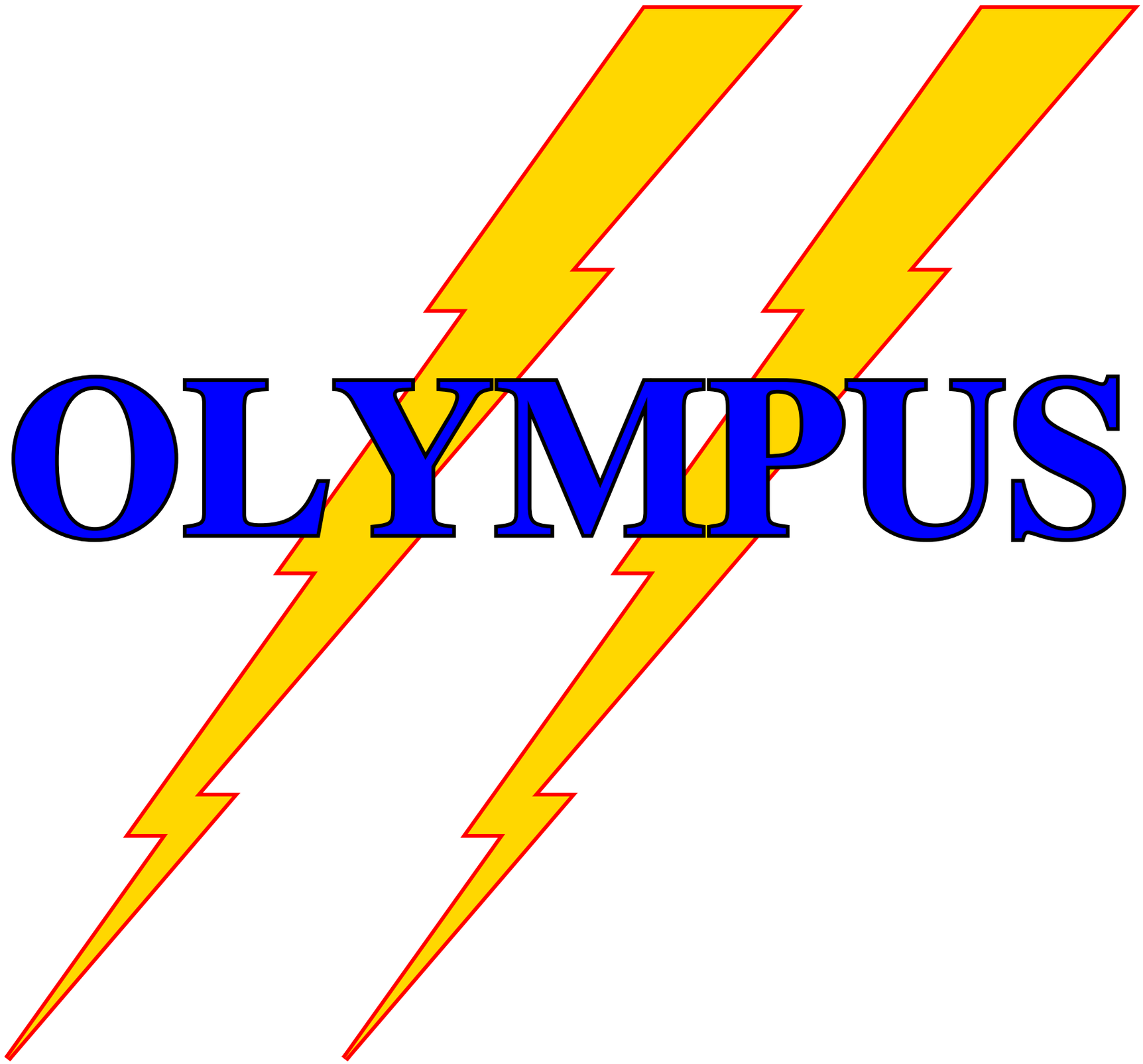
Logo 2



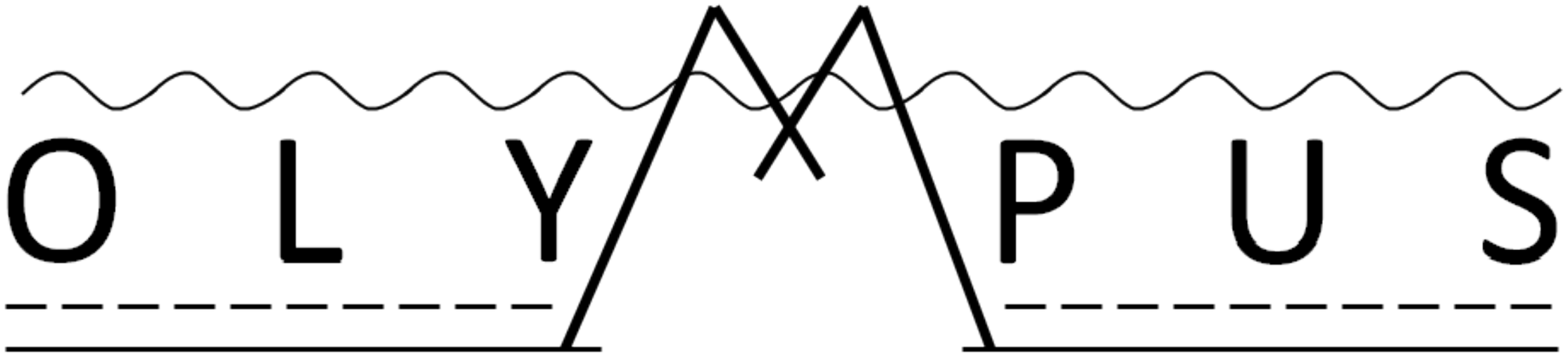
Logo 3



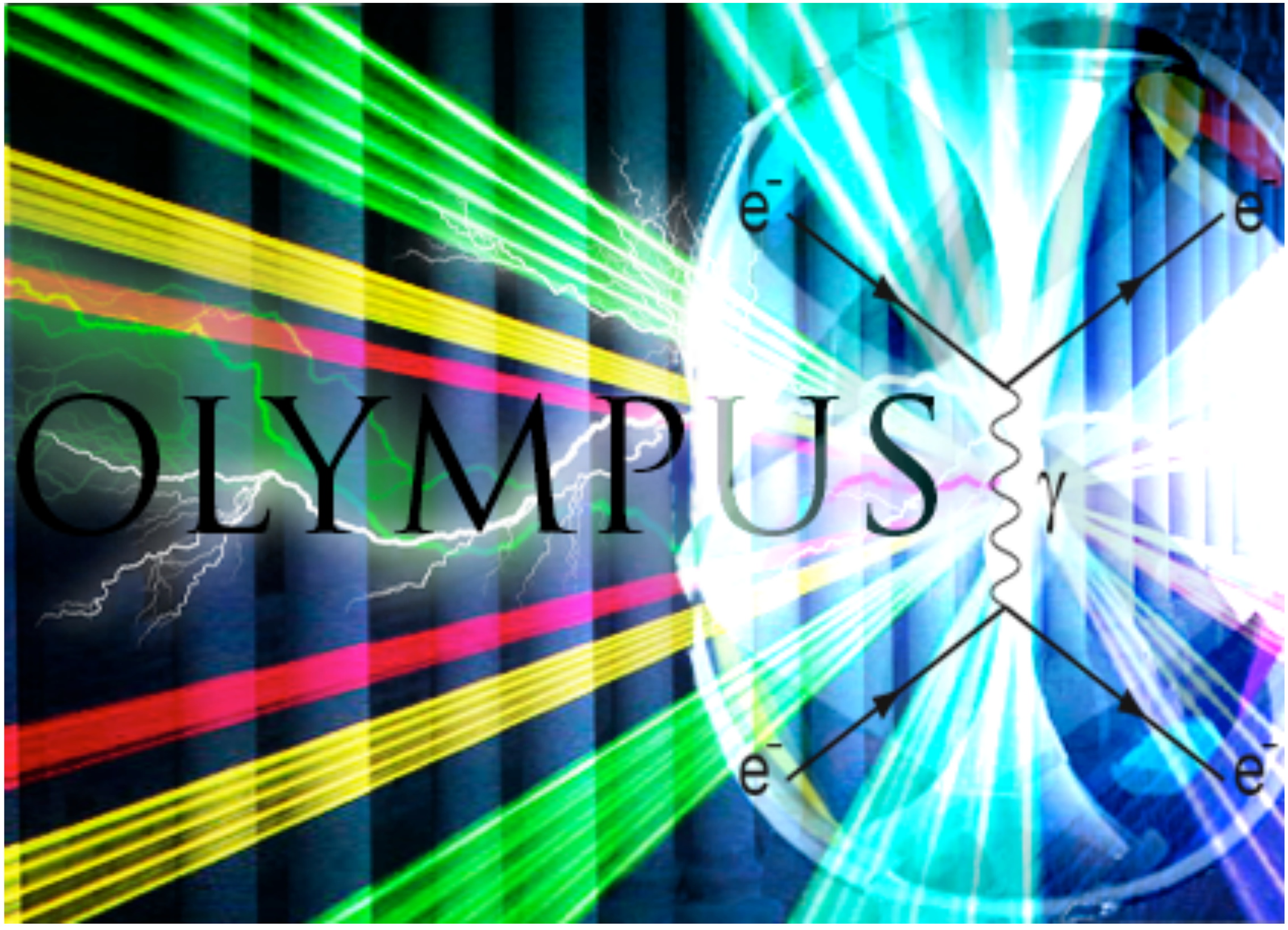
Logo 4



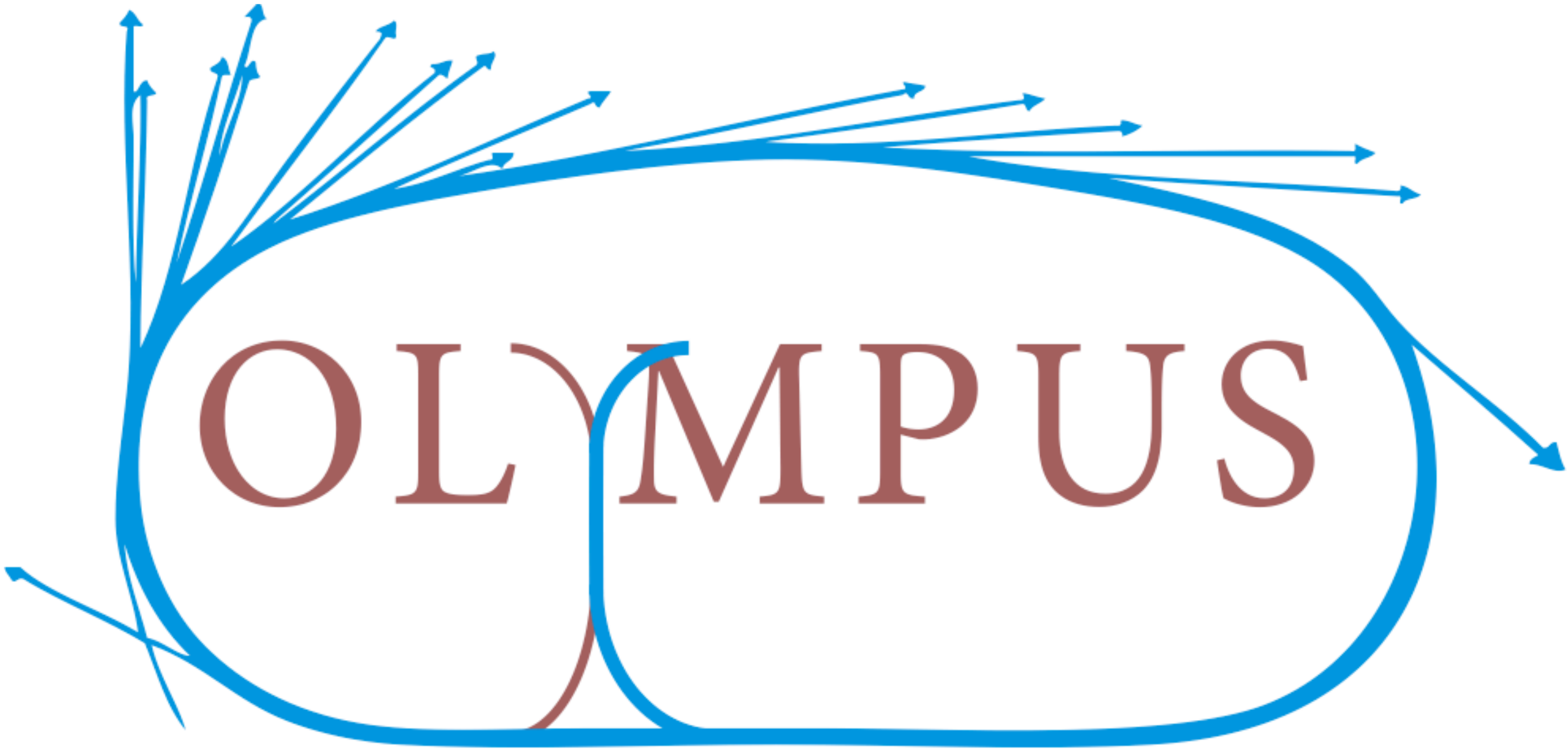
Logo 5



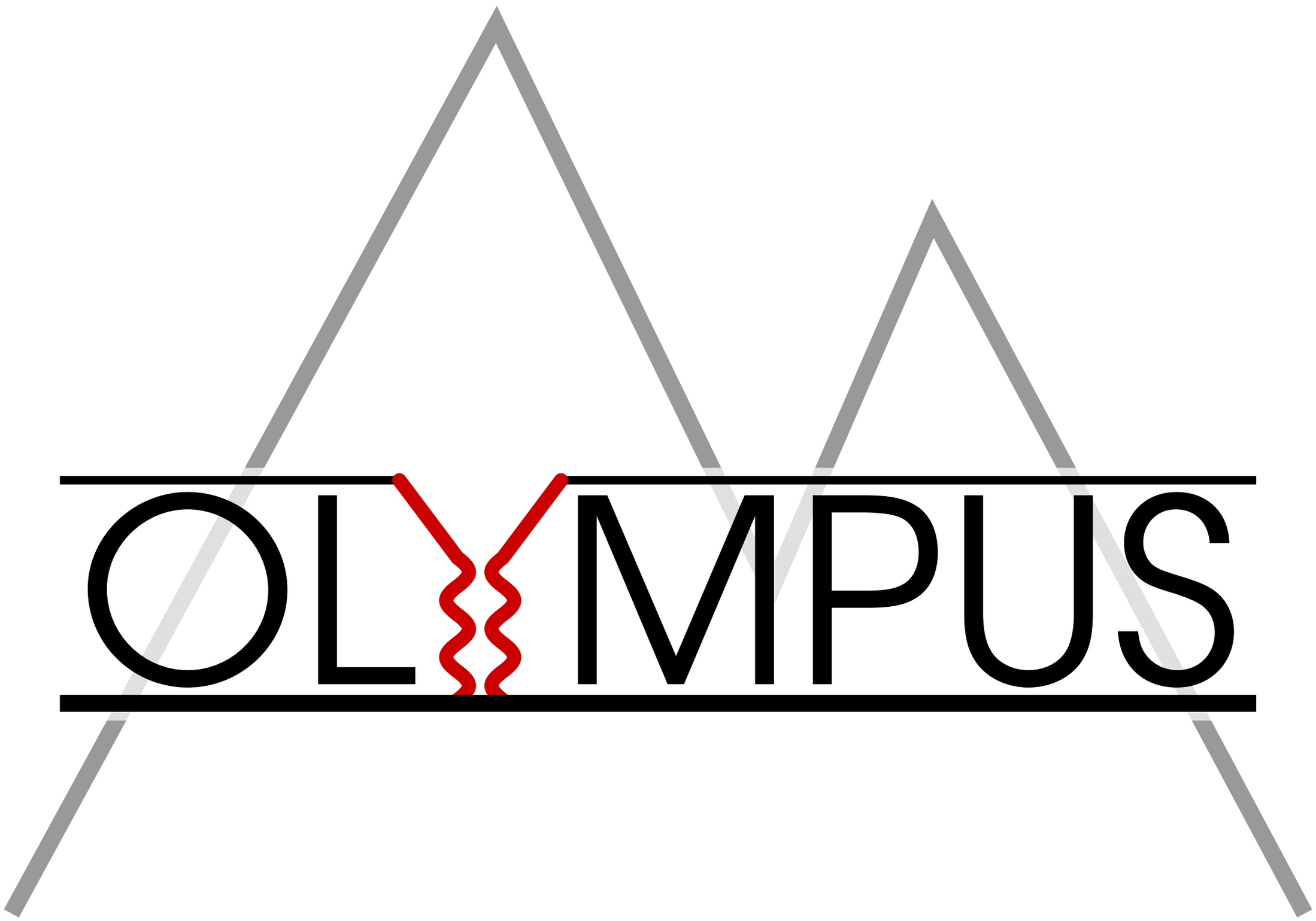
Logo 6



Logo 7



Logo 8



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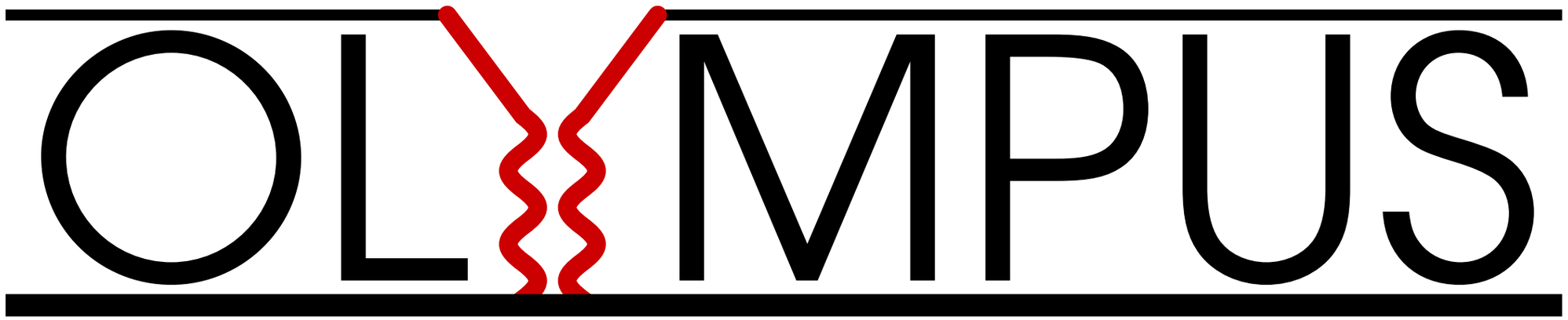

Logo 9

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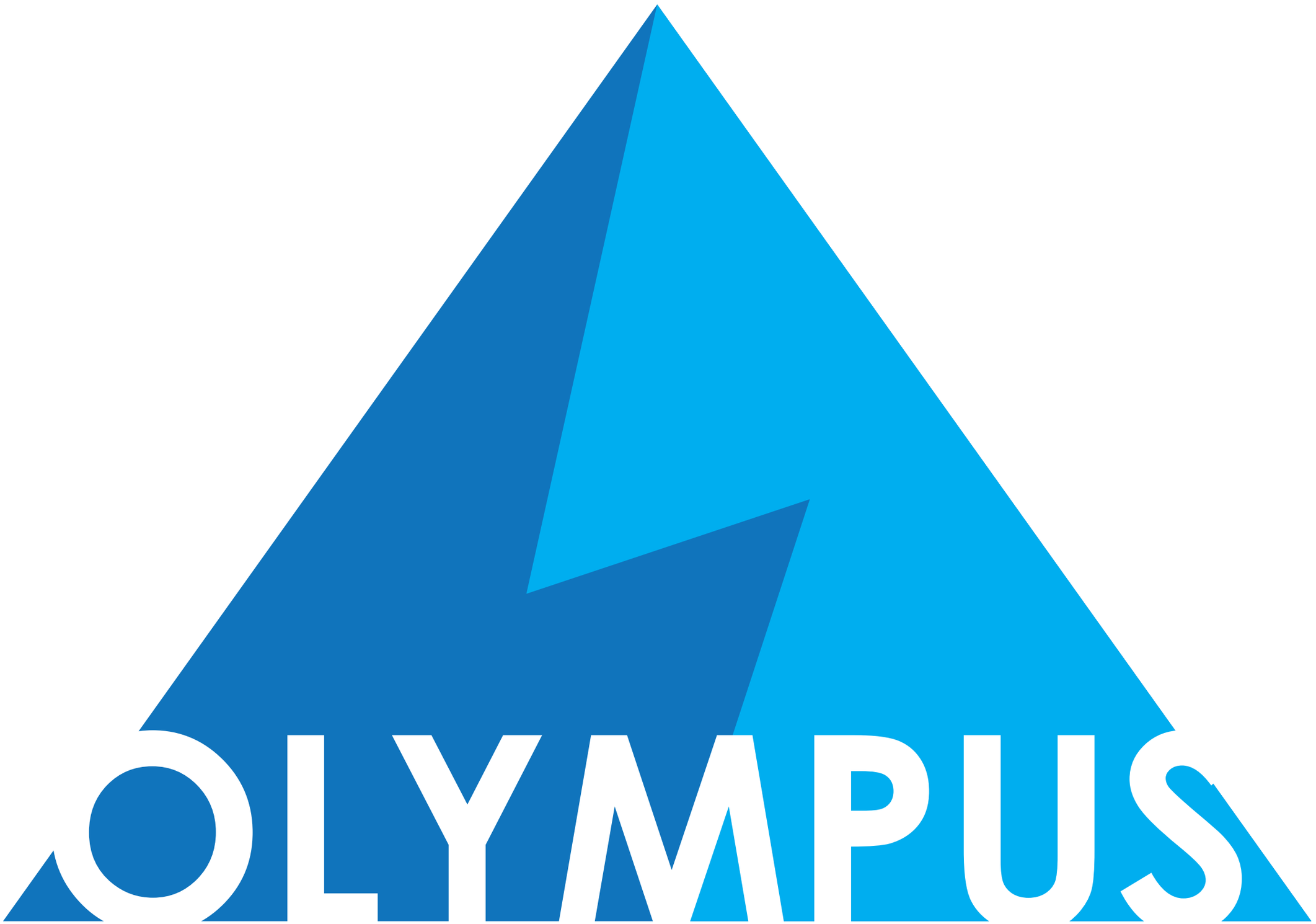

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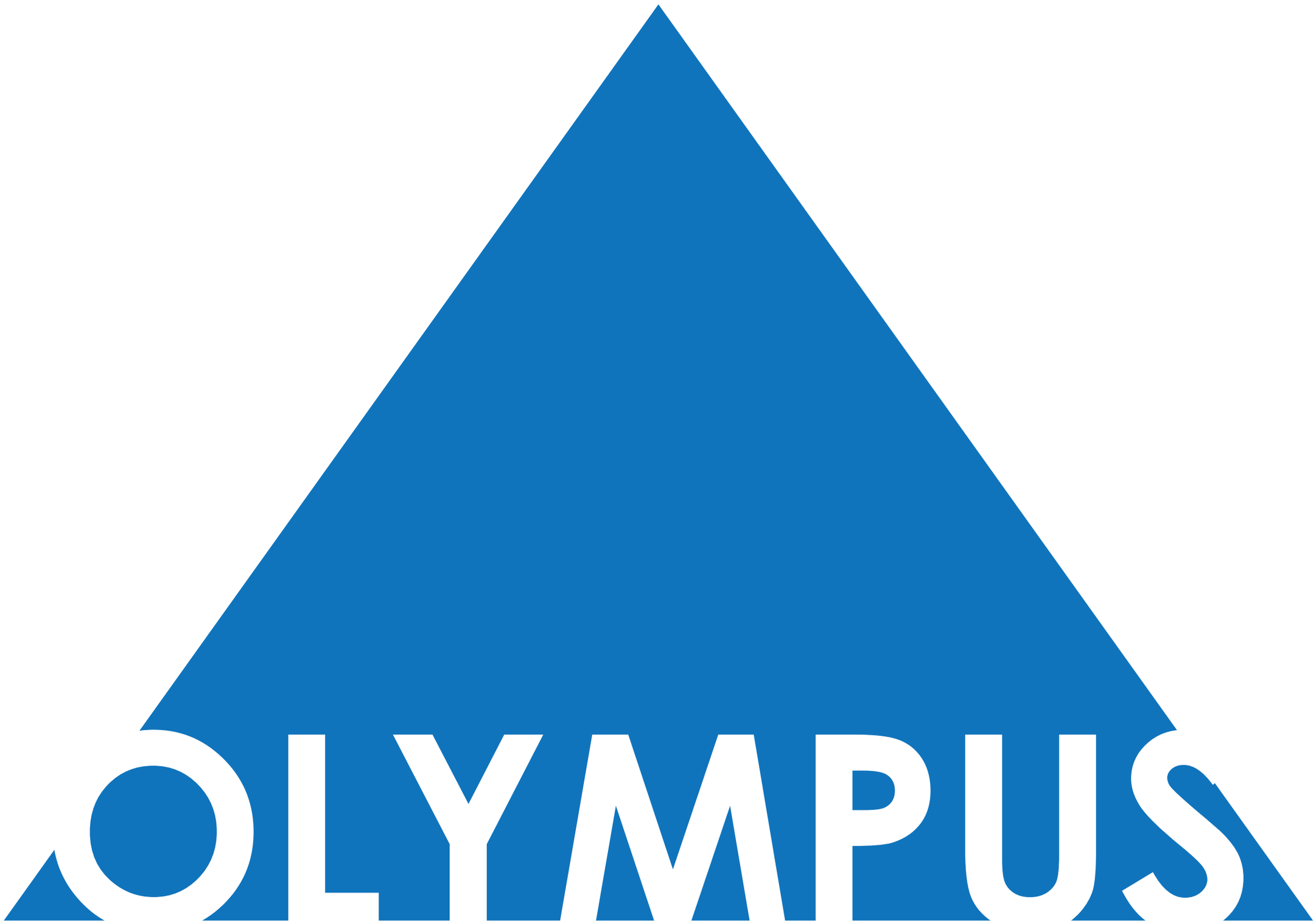
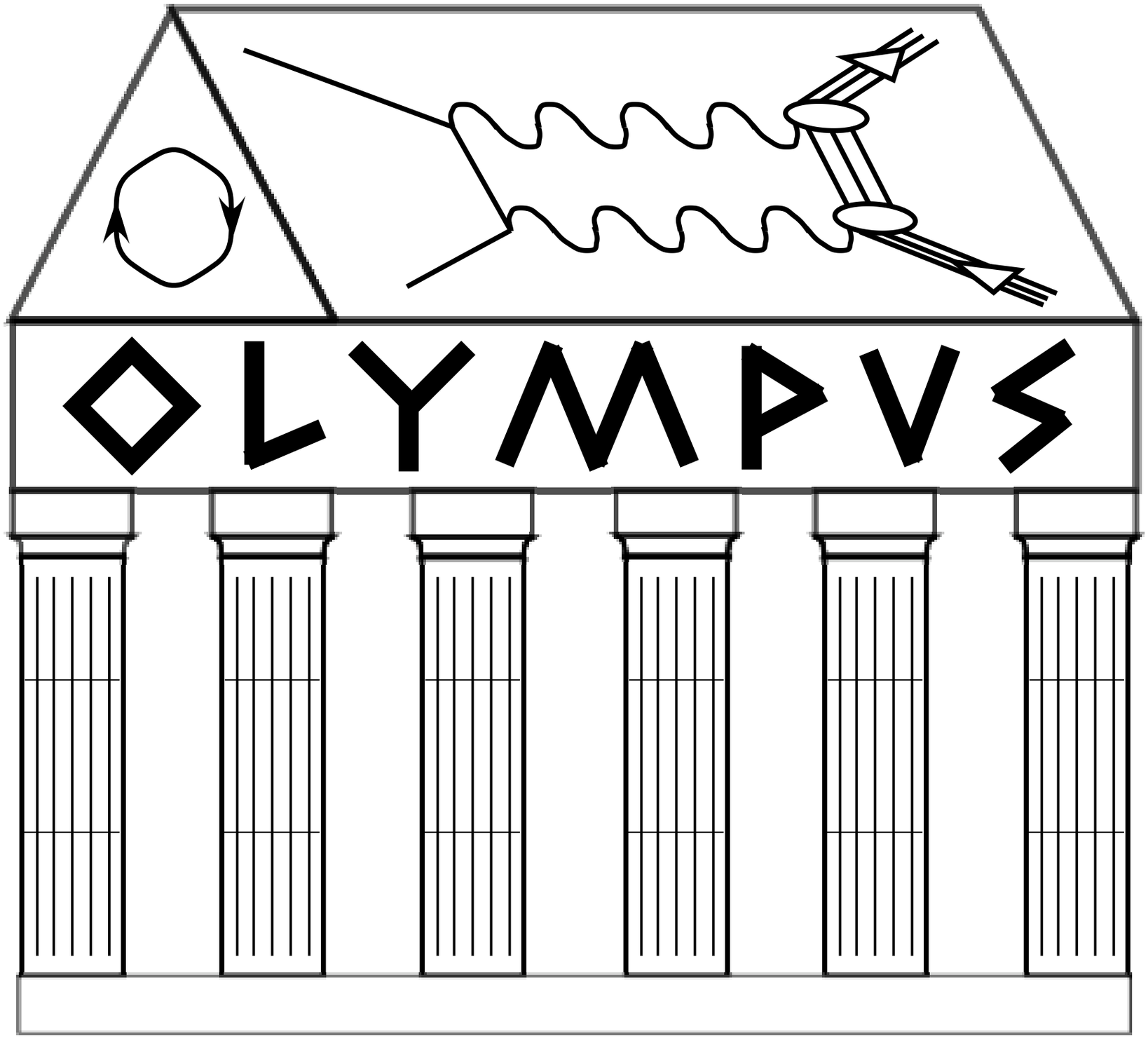


Logo 10



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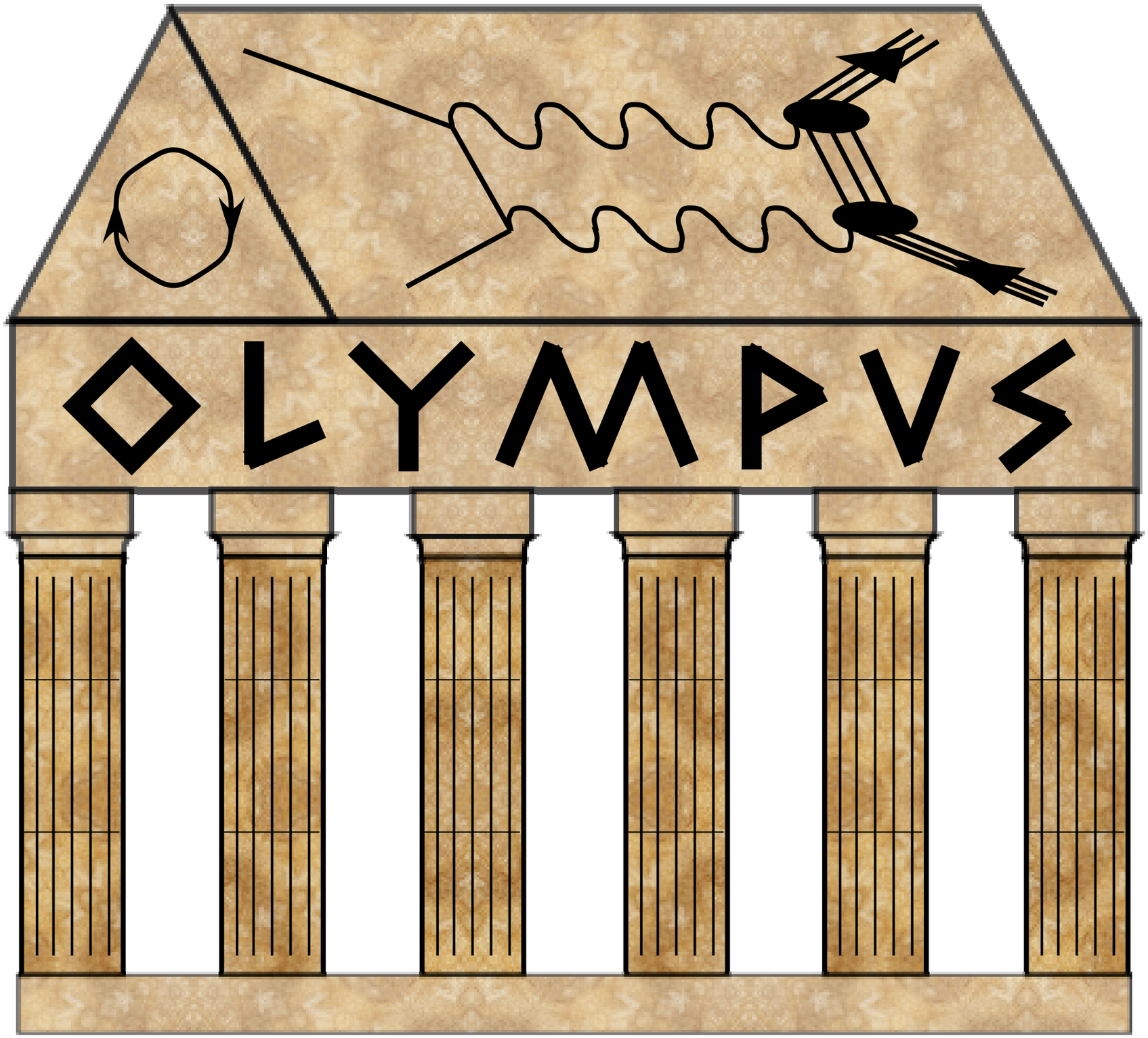

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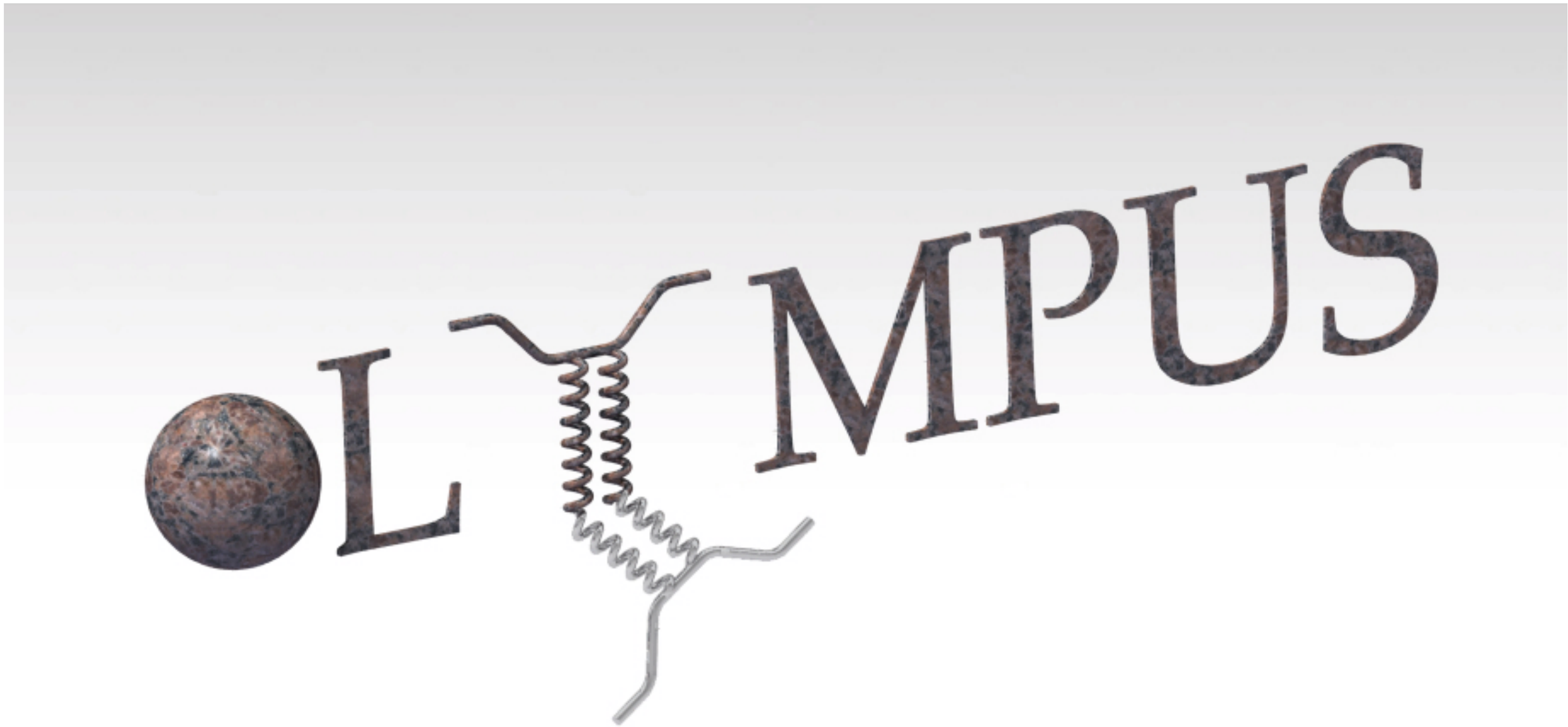

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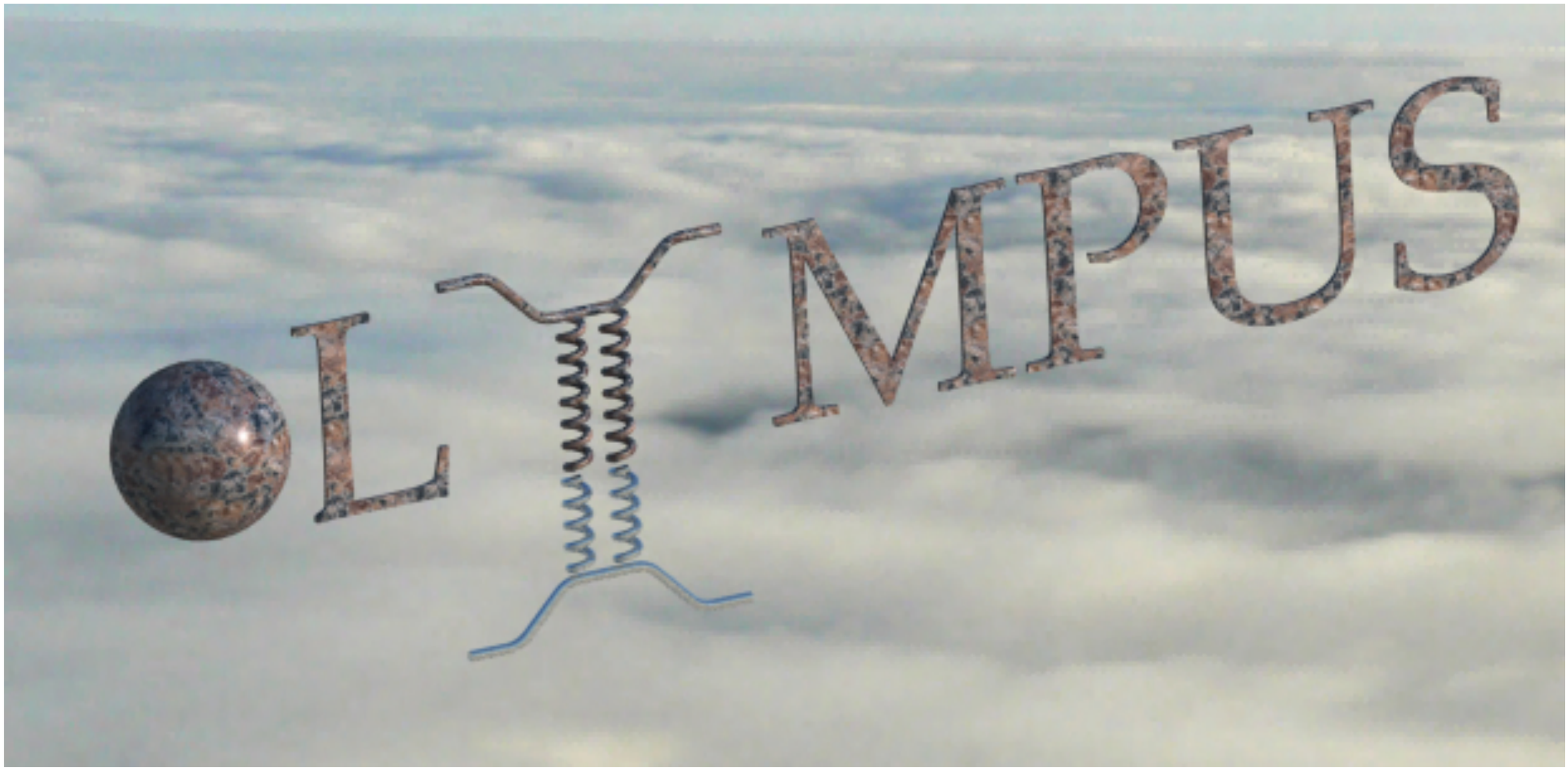

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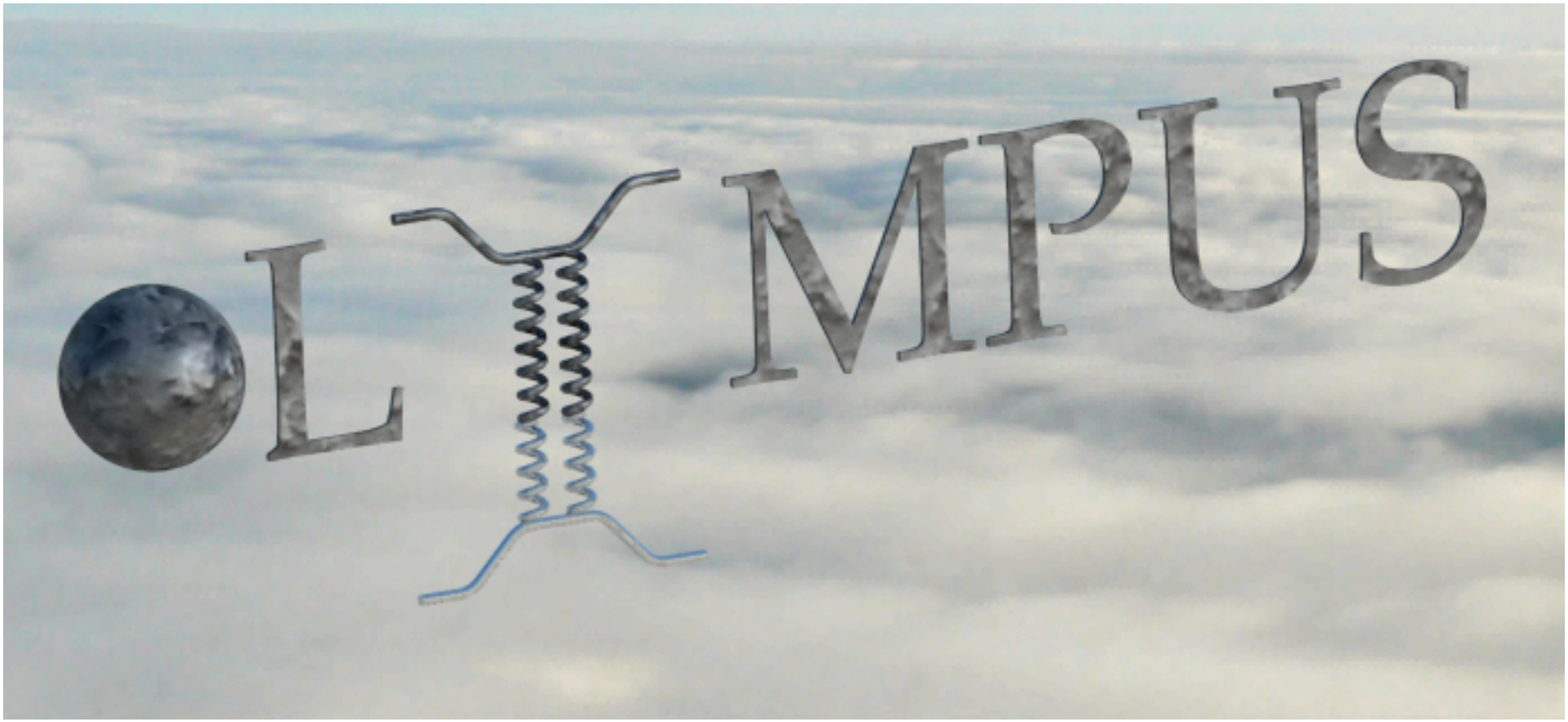

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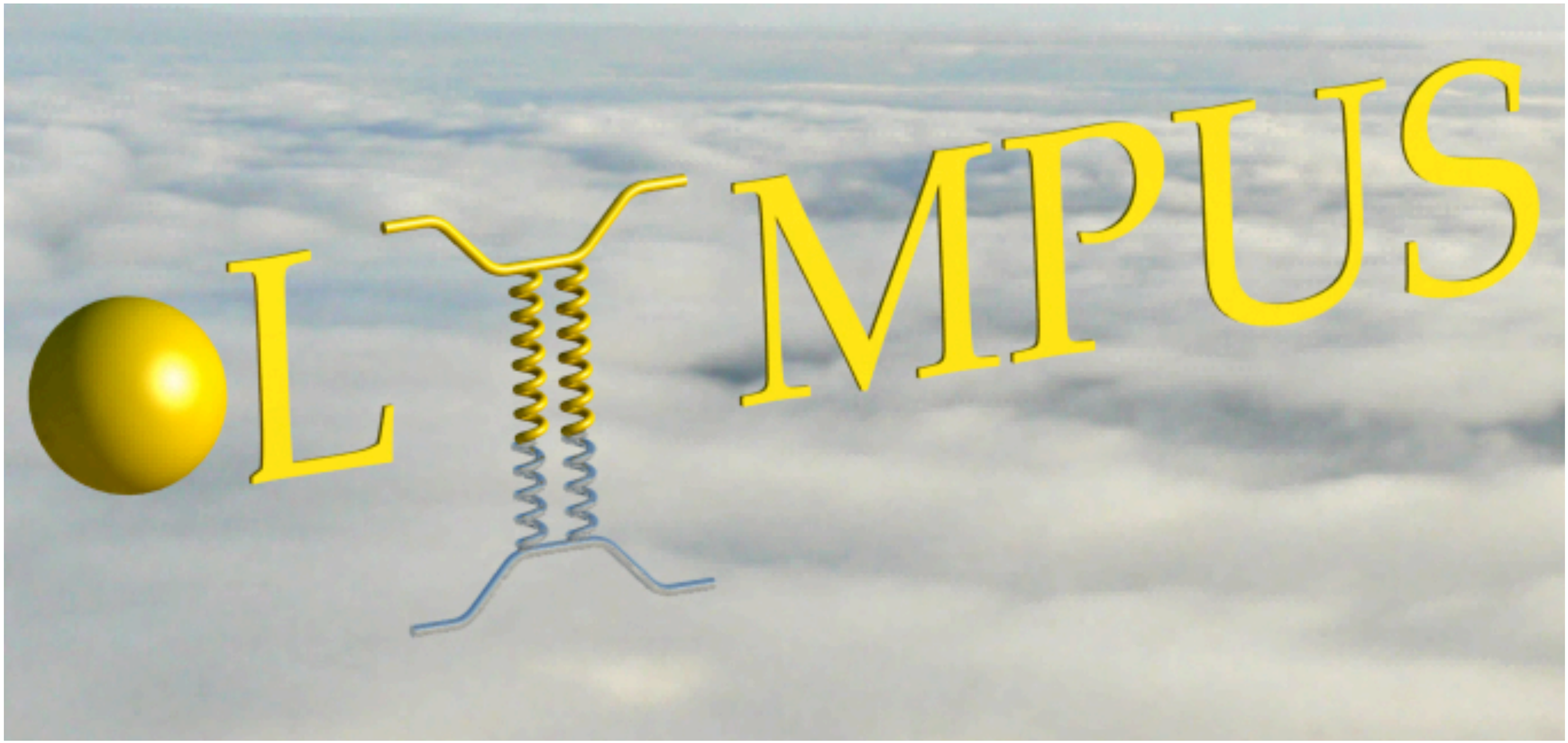

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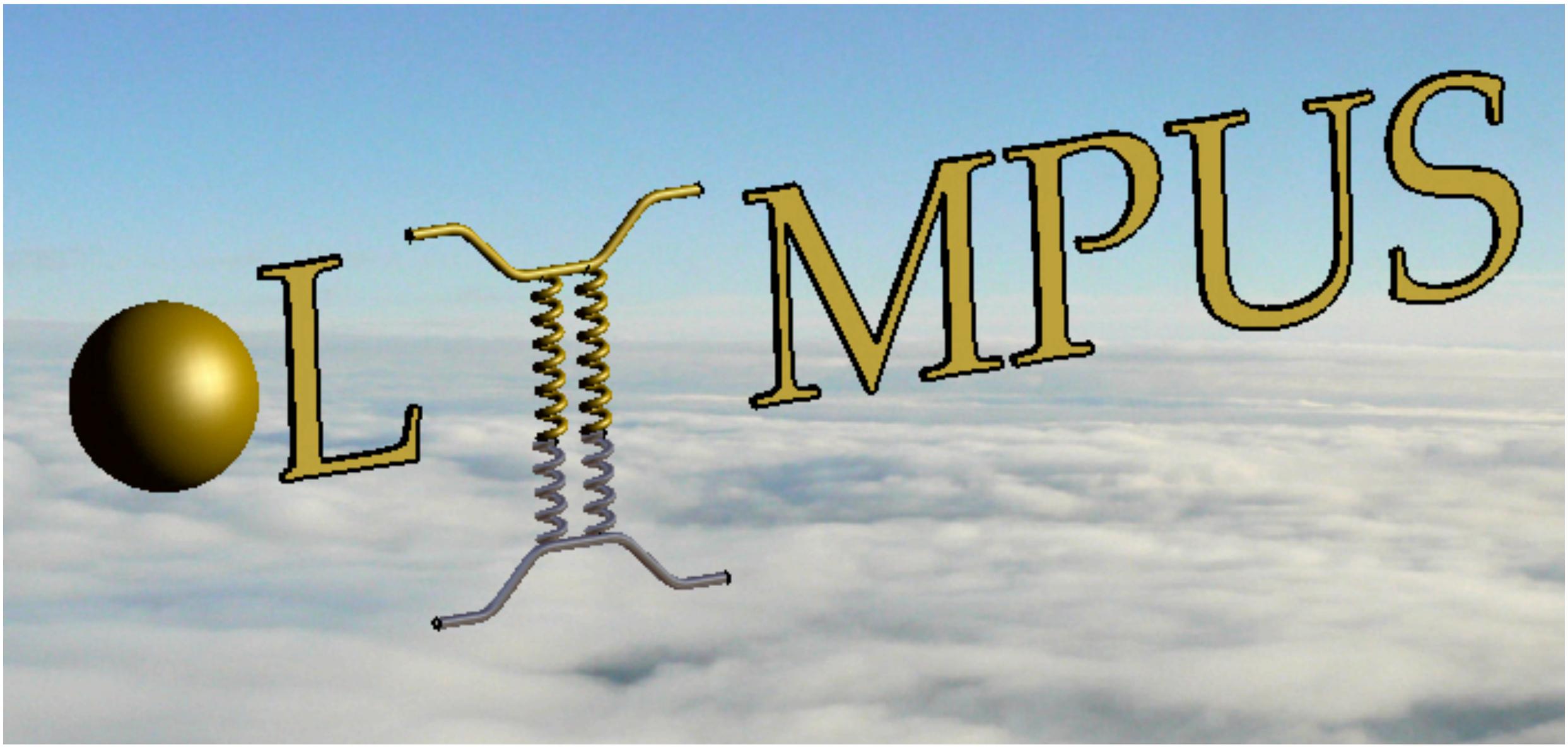
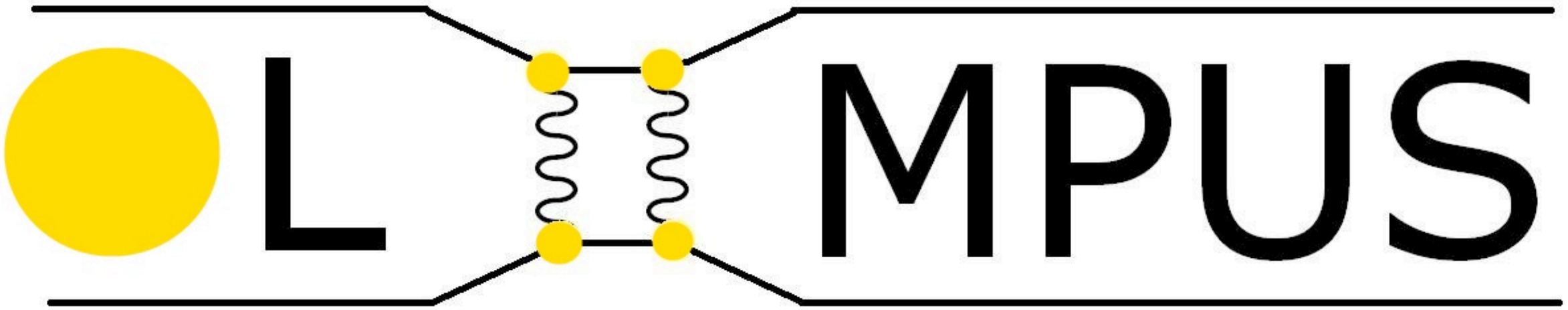


Logo 12



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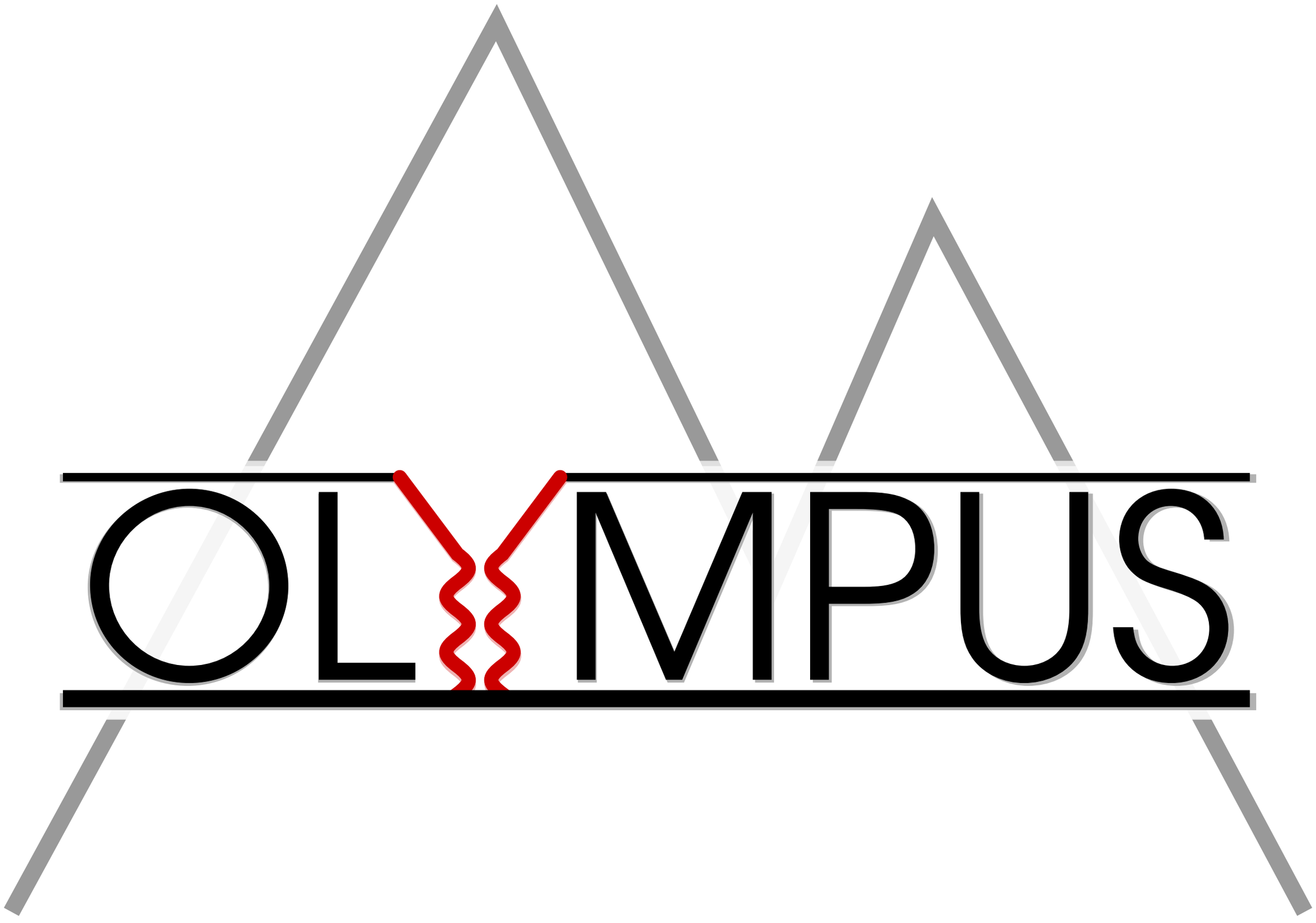

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