

**WG1 Minutes**  
**Wednesday January 8<sup>th</sup> 2020, 09:00 – 10:45**  
**Gallery 1 in EMCC**

**Present:**

Dave Brown (DGB)	Kent. And Servier
Keith Wilson (KSW)	York
Vilmos Fulop	Warwick
Peter Moody	Leicester
Michael Hough	Essex
Eugene Krissinel (EK)	CCP4
Svetlana Antonyuk	Liverpool
Mark Roe	Sussex
Gwyndaf Evans	Diamond
Paul Elliot	Oxford
Roberto Steiner	Kings - London
Paula Salgado	Newcastle
Daniel Rigden	Liverpool
Kevin Cowtan	York
Garib Murshudov	MRC-LMB
Frank von Delft	Diamond/Oxford
Randy Read	Cambridge
Tom Burnley	STFC
Atlanta Cook	Edinburgh
Ed Lowe	Oxford
Arnaud Basle	Newcastle
James Murray	Imperial College
Dave Lawson	John Ines Centre (JIC)
Phil Evans	MRC-LMB
Eleanor Dodson	York
Nicholas Keep	Birkbeck - London

**1. Chair: Opening Remarks**

Attendance at WG1 is important, academics and industrials all welcome

**Question** Frank von Delft (FvD): is everyone eligible for WG1 aware they are eligible and invited?

Note: Roberto Steiner (RS): This question comes up every year, it comes

**Action:** it is on the website, but perhaps we should alert via the Bulletin Board. But it could be made more visible on the registration form and Eligibility criteria should also be on the form DGB. **Action:** Karen McIntyre.

CCP4 were successful in being awarded a new BBSRC grant for 5years which runs until March 2024. This new Grant commenced April 2019 with Dave Brown as PI and COI at Liverpool (Rigden), DIAMOND (Evans), RCaH (Krissinel), LMB (Murshudov) York (Cowtan) and Southampton (Tews).

**Comment** Frank von Delft We should advertise this success more widely. **Action** Highlight on Web and Bulletin Board KSW.

Dave Brown took a full-time position in Industry in June 2019 making him ineligible to hold the CCP4 grant. He maintains an honorary position at the University of Kent. As such with agreement from BBSRC the PI of the grant was transferred to Kevin Cowtan in April, but Dave Brown is staying on as chair until a suitable replacement is found.

The current version of the software suite is CCP4 7.0.78 (with a planned release of version 7.1 in February 2020). An update mechanism allows users to keep the suite up to date without installing a new formal version. To-date, 78 updates have been released to users, covering bug fixes, updates to programs and new programs.

The development of CCP4 Cloud, providing interactive on-line access to CCP4 software, has progressed to a pre-release stage, and was tested at five CCP4 international workshops. CCP4 Cloud Client, linking locally installed image processing and graphical tools (particularly, Coot), with CCP4 Cloud, will be included in CCP4 release 7.1 (in final preparations). A link between CCP4 Cloud and STFC Cloud, based on OpenStack and maintained by Scientific Computing Department of STFC, is under development.

CCP4 Cloud is available at <https://cloud.ccp4.ac.uk> and works in any modern browser, including mobile devices such as tablets, ipads and smartphones. The CCP4-Online web services

(<http://www.ccp4.ac.uk/ccp4online>) have been linked to ARP/wARP and PDB\_REDO web services thanks to WestLife developments. This includes Single-Sign-On via ARIA authentication.

**Question FvD:** what is the long-term future? Policy on i2 and cloud? **Response:** CCP4 Exec will inform WG1 when a clear path and timeline on how we deliver the suite e.g. i1 to i2 and how cloud services fit in.

Dave Brown (DB) highlighted the importance of industrial license income so we need to assess how they will receive CCP Cloud. Action for Eugene to test install at AZ and Servier prior to Cosener's.

Need to support i2 and invest in the cloud to get feedback

Eugene Krissinel (EK): we use roadshows to gain an understanding of use and gather feedback

DB: Discussion at Cosener's. This time next year more on this. **Action for Cosener's:** KSW.

Thanks to the study weekend organisers. The 2020 Study Weekend was held at Nottingham on 7-9 Jan 2020 and focussed on Model Building and Beyond with scientific organisers Alan Roseman (Manchester, UK), Jon Agirre (York, UK) and Robbie Joosten (NKI, Netherlands).

Training schools in this period included: A celebratory 40th anniversary meeting at the Royal Thailand SEA-COURT 21-26 January; Society 9th July; BCA Summer School in York; APS workshop 17-24 June; ECM workshop 28 August; DLS workshop 2-8 December

## 2. Finance (See additional document)

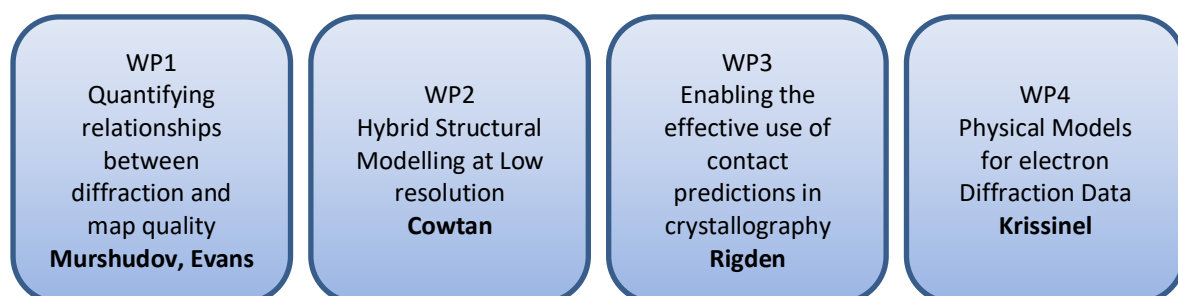
Overspending of £300k per year, continue to do so over the next couple of years to spend down reserves however to sustain existing full-time staff we will be coming into the regime where we need to increase income. WG1 were asked to approve an increase in the license fee by £500 to £11k on the industrial licenses. **Action:** proposed increase of £500 approved. Date to be confirmed.

Note Grant pays for development of novel scientific software and Licenses sustain overheads.

Keith Wilson (KSW): But note there is no money for new activities for the next 2-3 years.

## 3. CCP4 Grant (Kevin Cowtan)

4 Work packages over 5 years



**WP1. Quantifying relationships between diffraction and map quality. (Evans, DIAMOND and Murshudov, LMB Cambridge)**

**Objectives:** To expand METRIX database and develop machine learning to support interactive decision through use data-quality as indicators of data-utility in structure determination.

To develop Fourier optics-based relationship between diffraction, phase and map quality applicable to scattering experiments including X-ray diffraction, electron diffraction and also cryoEM.

To develop new tools for refinement for electron diffraction data.

**WP2. Develop shift field refinement methods for Hybrid Structural modelling at low resolution and provide significant refinement speed enhancements. (Cowtan, York)**

**Objectives:** To generalise and optimise shift field methods for wider applicability against multiple data sources.

To implement new resolution independent model building framework in BUCCANEER and NAUTILUS

To develop new stereochemical regularisation software library to enable critical speed improvements. To implement contact predictions developed in WP3 within BUCCANEER and NAUTILUS

**WP3. Implementation and exploitation of contact prediction approaches in crystallographic structure solution and validation. (Rigden, Liverpool)**

**Objectives:** To implement contact prediction methods in ConKit to accurately define domain boundaries for both protein construct design and model building.

To use contact predictions to provide a new size range of search models for Molecular Replacement.

To develop tools that utilise contact prediction to assist in validation and interpretation of macromolecular structures particularly identification of biologically relevant protein:protein interfaces

**WP4. Physical Model for Electron Diffraction (Krissinel, RcaH)**

**Objectives:** To develop a model of electron scattering for computer simulations to assist in software and experimental design.

To develop and implement scaling algorithms for electron diffraction

To link to WP1 to develop new tools for refinement for electron diffraction data.

**WP1 (Oxford, Cambridge): Quantifying relationships between diffraction and map quality.**

- Map quality estimation, Fourier optics, X-ray/electron/EM
- Oxford (Gwydraf): Melanie Vollmar
  - Expansion of METRIX database done.
  - Classification of experimental phasing datasets by solvability done.
- Cambridge (Garib):
  - Formulas for reliability of maps has been designed. Error propagation has been applied to account for noise contribution from model errors to map errors.
  - For refinement: against electron diffraction Mott-Bethe formula is being tested. Screening parameter refinement is thought of and being implemented.
  - Regular meetings with Diamond collaborators has been set up.

**WP2 (York): Develop shift field refinement methods for Hybrid Structural modelling at low resolution.**

- New techniques for fast combined model rebuilding and refinement.

01/10/2021 - 31/03/2024. PDRA Paul Bond

- Shift field refinement code tested and released to CCP4 trunk
  - An inadequate paper was submitted and withdrawn until staff time available to write a better one.

(CCP4 to fund Scott Hoh to link Clipper and GEMMI)

**WP3 (Liverpool): Implementation and exploitation of contact prediction approaches in crystallographic structure solution and validation.**

- Contact prediction for construct design, model building, validation and refinement
  - 01/10/19 - 30/09/19. PDRA Javier Burgos-Marmol

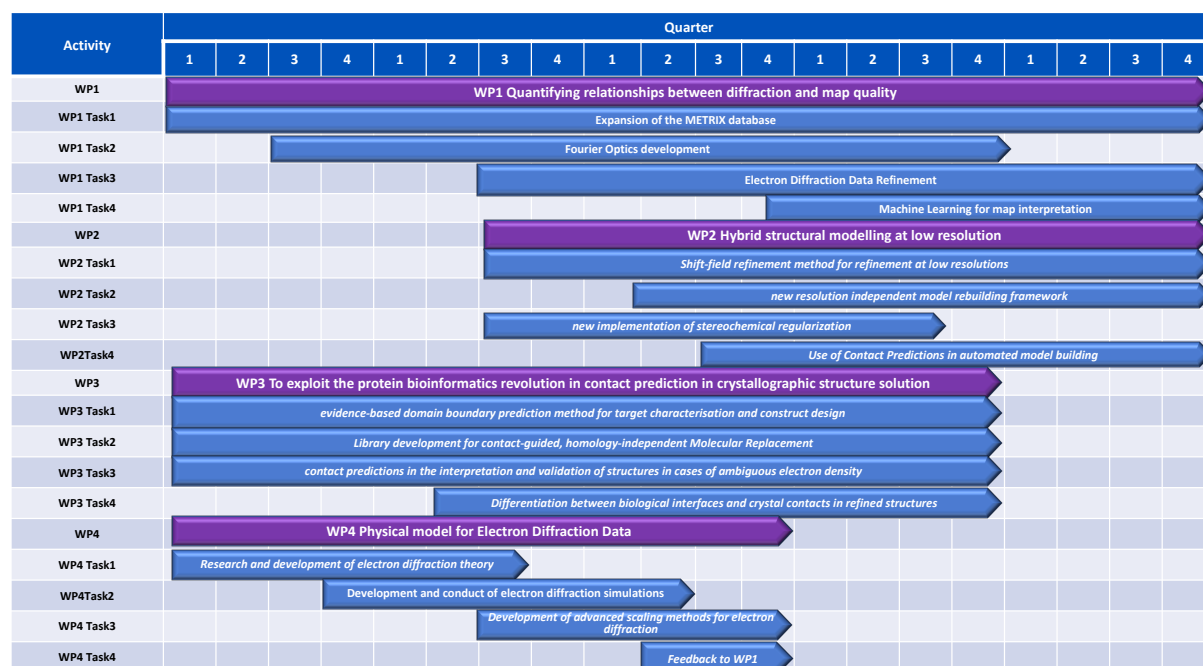
- Extending PISA to include a covariance score as an indicator of a biological relevant interface in a crystal structure in progress.
- Scores will be tested against a dataset of interfaces. Within 12 months we expect to finalise this and move on to covariance-based domain boundary prediction
- Publications expected for ResearchFish:
- Molecular replacement using structure predictions from databases. Simpkin et al Acta Cryst. 2019.
- Using Phaser and ensembles to improve the performance of SIMBAD. Simpkin et al Acta Cryst. 2019, in press

#### WP4 (Diamond): Physical Model for Electron Diffraction

- Modelling electron diffraction, scaling and tools
- 01/04/19 - 31/03/22
- Candidate recruited and will start 01/02/2020

#### Impact (Southampton)

- CCP4 web pages redesigned and will be released this year
- CCP4 Study weekend 2020 planned & organized
- 2 WG2 meetings.
  - Coot, PDB-REDO, data mining, validation, ligands
  - GEMMI, Metals, XChemexplorer, TCR, MRparse, Machine Learning



Additional Outreach activities also funded– Role of WG2 and Meeting and workshop activities

## 4. WG2 Update (Ivo Tews)

### WG2 Presentation

Request for input into next SW subject.

Garib Murshudov integrative (ing/ed) Structural Biology - Combined Structural Approaches. Are we losing CCP focus with this? RS sees this as long as the didactic is not lost its still a CCP4 focus.

Scope creep are we overlapping with other CCPs /meetings – need to inform other CCP leads. RR MR focusing on difficult problems need to discuss this keep the “deep dive”.

Suggested names of organisers.

Maya Topf suggested by Randy Reed.  
 Roberto Suggested by Garib.  
 J Prakash cross link MS and spectroscopy Atlanta Cook.  
 Tracey Gloster from St Andrews suggested by Eleanor.

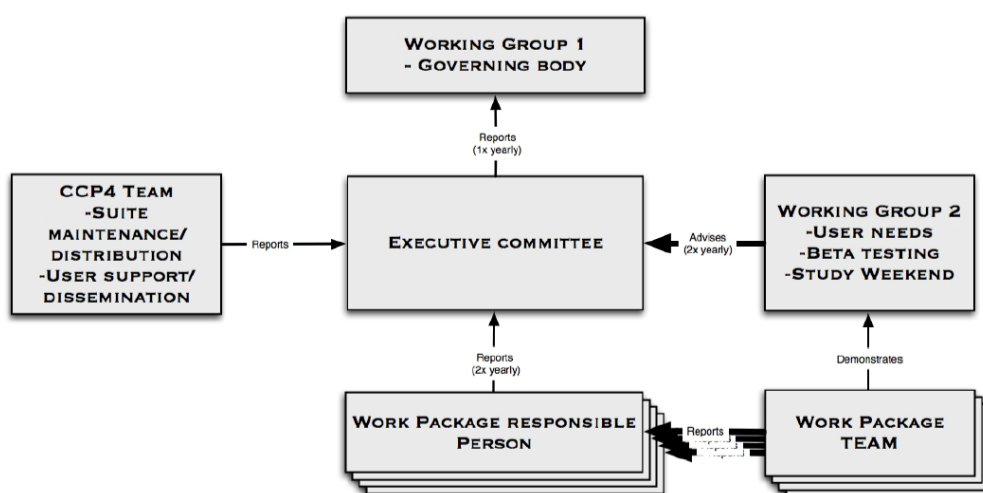
SW 2022 Wed-Fri 5-7<sup>th</sup>,

FvD question WG format and frequency - WG2 Forum seen as useful by developers GE/RS/GM.

FvD Is there an overview of all CCP4 activities for WG1 to comment on? Currently not – it may be a good idea to have 1 liners of all activities (compare to 1-page reports of funded staff). Action Present a brief summary of sponsored activities and Annual WG1. EK

Suggestion on using video links for topics at WG2. **Action:** Ivo Tews.

## 5. Infrastructure



## 6. Current CCP4 Executive

Elected		Co-opted	
Dave Brown	Chair 2015 – 21	Eugene Krissinel	Head core team WP PI
Judit Debreczeni	2017-21 Industry Rep	Kevin Cowtan	Grant WP PI
Nick Keep.	2019-21	Garib Murshudov	Grant WP PI
Paula Salgado	2017-21	Gwyndaf Evans	Grant WP PI, Diamond Rep
Mike Hough	2020-23	Martyn Winn	STFC Rep
Atlanta Cook	2019-22	Dan Rigden	Grant WP PI
Keith Wilson	Scientific manager		
Ivo Tews	Chair WG2	Eleanor Dodson	
		Randy Read	
		Phil Evans	

Suggestions for new Exec members:

Thanks to RS for service

Eleanor Dodson and Phil Evans stepping down, a massive thanks for many years of service appreciated by all

KSW: Martin Noble co-opted as i2 representative

Proposal and seconded: Dave Lawson – by show of hands voted in for 2020

Proposal and seconded: Helen Walden – by show of hands voted in for 2021

Proposal and seconded: James Murray – by show of hands voted in for 2021

#### Exec from March 2020

Elected		Co-opted	
Dave Brown	Chair 2015 – 21	Eugene Krissinel	Head core team WP PI
Judit Debreczeni	2017-21 Industry Rep	Kevin Cowtan	Grant WP PI
Nick Keep.	2019-21	Garib Murshudov	Grant WP PI
Paula Salgado	2017-21	Gwyndaf Evans	Grant WP PI, Diamond Rep
Mike Hough	2020-23	Martyn Winn	STFC Rep
Atlanta Cook	2019-22	Dan Rigden	Grant WP PI
Dave Lawson	2020-23	Martin Noble	i2 project leader
Helen Warden	2021-24	Randy Read	Phaser
James Murray	2021-24	Keith Wilson	Scientific manager
		Ivo Tews	Chair WG2

CCP4 Chair is also a member of the CCP Steering Panel that brings together all CCPs to share progress and look for synergistic opportunities. [http://www.ccp.ac.uk/steering\\_panel.html](http://www.ccp.ac.uk/steering_panel.html)

### 7. WG1 and Speaker dinner at Study Weekend

GM – would prefer to merge with everyone

Note this is also a shared Diamond – meeting dinner

Peter Moody (PM) – are there more people coming to the Diamond meeting if this is on?

**Action:** Provide buffet style dinner for all Wednesday attendees if we want a separate invited speaker dinner host this in the Orchard Hotel for speakers and organisers and invite Exec core.

### 8. AOB

Minutes and actions should be on the web?

KSW: very late last year, but will be better this year!