Siril Guide CAFALD v1.01

CFALD currently operates ONLY on raw, uncalibrated light frames (`light.fit`).
It must **NOT** be applied to `pp_light.fit` or any preprocessed/calibrated output.

Applying calibration (darks, flats, bias) **before** CFALD destroys the CFA photosite structure CFALD relies on.

We are actively working on a **separate CFA-domain calibration path**, but this is **not yet part of the standard workflow**.

What CFALD Works On (Today)

✓ Raw CFA light frames (`light.fit`)
✗ Preprocessed lights (`pp_light.fit`)
✗ Debayered images
✗ Any image that has undergone interpolation or resampling

CFALD must see the **original Bayer mosaic exactly as captured by the sensor**.

Recommended Siril Workflow (Current / Stable)

1️⃣ Normal RGB Calibration (Standard Siril Workflow)

Process your colour data exactly as you normally would:

1. Load RAW lights, darks, flats, bias
2. Run Siril preprocessing
3. Register and stack
4. Debayer → RGB
5. This produces your **fully calibrated RGB image**

This RGB stack is used **only for colour**.

2️⃣ CFALD Luminance Extraction (Separate Path)

This is a **parallel workflow**, not a replacement.

1. Load **raw `light.fit` frames only**
2. Do **NOT** preprocess
3. Do **NOT** apply offsets, flats, or darks
4. Apply CFALD to each raw light frame
5. Register the CFALD frames
6. Stack, no drizzle

Result:
✓ High-SNR CFA-domain luminance
✓ No demosaic noise
✓ Spatial detail reconstructed by registration + drizzle

3️⃣ Combine CFALD Luminance with RGB

Use CFALD output exactly like a mono luminance:

- CFALD stack → **L**
- Siril RGB stack → **RGB**

Final step:

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L + RGB → LRGB combination
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You now have:

- Mono-like depth from CFALD
- Full-resolution colour from calibrated RGB
- Both extracted from the **same OSC data**

Why Calibration Is Currently Excluded

Calibration frames:

- Resample pixels
- Mix CFA photosites
- Break the one-photosite = one-sample assumption

CFALD depends on:

> **One spatial location sampled multiple times through the CFA**

Once calibration touches the data, that assumption is no longer true.

Work in Progress (Important Note)

🚧 **CFA-domain calibration for CFALD is under active development**

We are experimenting with:

- CFA-aware dark subtraction
- CFA-preserving flat correction
- Channel-separated calibration strategies

Until this is complete and validated:

> **Calibration must be applied only to RGB, not CFALD**

> **CFALD is applied only to raw light frames (`light.fit`) and is used as a luminance layer combined with a normally calibrated RGB stack.**
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