

# Research Area 2: Updates

Decays of bottom, charm, and strange quarks

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# RA2 funding project applications

## We received 18 different funding project applications:

- RA2-1: B Decays with multi-hadron final states (Hanhart, Kubis, Mannel)
- RA2-2: Excited Lambda spectrum in rare B decays (Albrecht, Thoma)
- RA2-3: Unraveling the  $D^{**}$  (Hanhart, Kubis, Neubert, Prim)
- RA2-4: QED Corrections in Bottom decays (Albrecht, Mannel)
- RA2-5: Charming Darwin (Albrecht, Bernlochner, Lenz)
- RA2-6: Combined BelleII and LHCb Wilson Coefficient analysis (for CC semileptonic) (Albrecht, Bernlochner, Prim)
- RA2-7: Phenomenology of Bs to 4 leptons (Albrecht, Stamou)
- RA2-8:  $V_{xb}$  (Bernlochner, Dingfelder)
- RA2-9: Light Cone distribution amplitudes of B hadrons (Feldmann, Gubernari)
- RA2-10: Analytic Properties of the charm contribution in b to s II (Gubernari, Kubis)
- RA2-11: Semi-inclusive semileptonic B decays (Mannel, Prim)
- RA2-12: CPV in hadronic D decays (Feldmann, Hiller, Lenz, Mitzel)
- RA2-13: Constraining NP in rare semileptonic charm decays (Hiller, Mitzel)
- RA2-14:  $R(D^*)$  with semileptonic tagging (Prim)
- RA2-15: Charm decays with invisibles (Hiller, Stefkova)
- RA2-16: Inclusive Semileptonic decay rates of B and Bs mesons (Garofalo, Gross, Ubrach)
- RA2-17: Flavor Structure in Axion models and generic extension with light NP (Feldmann, Stamou, Stefkova)
- RA2-18: Beyond the Standard Model effects in tree-level B decays (Albrecht, Lenz)

# Selected Projects and Funds Allocation

## Research Area 2

|        | PI                             | Short Title                                                                                          | Personnel (FTE) | Recommended Duration (month) | Total FTE | Comments                        |
|--------|--------------------------------|------------------------------------------------------------------------------------------------------|-----------------|------------------------------|-----------|---------------------------------|
| RA2-2  | Albrecht, Thoma                | Excited Lambda spectrum in rare B decays                                                             | 0,67            | 36                           | 2,00      | Albrecht 100%                   |
| RA2-6  | Albrecht, Prim, Bernlochner    | Combined Belle II and LHCb Wilson Coefficient analysis (for CC semileptonic)                         | 1,00            | 6                            | 0,50      | Bernlochner 100%                |
| RA2-7  | Albrecht, Stamou               | Phenomenology of Bs to 4 leptons                                                                     | 0,67            | 36                           | 2,00      | Stamou 100%                     |
| RA2-8  | Bernlochner, Dingfelder        | Precision Measurements of $ V_{ub} $ and $ V_{cb} $ with Exclusive and Inclusive Semileptonic decays | 1,00            | 36                           | 3,00      | Bernlochner 50%, Dingfelder 50% |
| RA2-12 | Feldmann, Hiller, Mitzel, Lenz | CPV in hadronic D decays                                                                             | 1,00            | 24                           | 2,00      | Lenz 75%, Feldmann 25%          |
| RA2-13 | Hiller, Mitzel                 | Constraining NP in rare semileptonic charm decays                                                    | 0,67            | 36                           | 2,00      | Mitzel 100%                     |
| RA2-16 | Garofolo, Gross, Urbach        | Inclusive Semileptonic decay rates of B and Bs mesons                                                | 0,67            | 36                           | 2,00      | Urbach 100%                     |
| RA2-17 | Feldmann, Stamou, Stefkova     | Flavor Structure in Axion models and generic extension with light NP                                 | 0,67            | 36                           | 2,00      | Stefkova 100%                   |

+RA2-1 will be funded via different sources

# RA2 Cross-functional Teams

## 1. FCNC SL(charm loops; connection with RA1)

- **Mulder, Gubernari**
- **Projects:** RA2-2, RA2-10, RA2-7

## 2. Charm physics (hadronic + SL?)

- **Hiller, Mitzel**
- **Projects:** RA2-5, RA-12, RA2-13, RA2-15

## 3. CC SL decays ( $V_{ub} V_{cb}$ , $R(D^{(*)})$ )

- **Mannel, Prim**
- **Projects:** RA2-3, RA2-8, RA2-11, RA2-14, RA2-16, RA2-9, RA2-4

## 4. Hadronic Multi-body (theory, experiment (Tim Gershon)?)

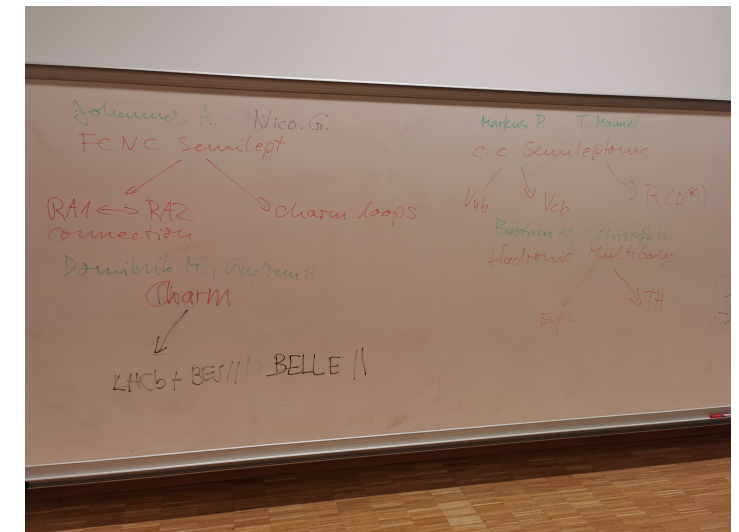
- **Kubis, Hanhart**
- **Project:** RA2-1

## 5. Light NP (connection with RA4)

- **Stamou, Stefkova**
- **Project:** RA2-17 (Merge with RA4 or 6)

## 6. WET EFT Fits

- **Kroninger, Hiller, Feldmann, Bechtel**
- **RA2-6 (Merge?)**



We plan to have a kick-off meeting with all the CFT leads to discuss the RA2 working model

# RA2 Working Model

## (Online) meetings for CFTs and RA2:

- **CFTs:** Depending on the project stage / theory- experiment interplay the CFT leads should decide on the intensity. We plan to create an RA2 Indico category where CFTs within RA2 will be listed as subcategories.
- **RA2 bi-monthly meeting:** Discuss general progress (conveners+CFT leads) to understand/monitor progress of different CFTs.

## In-person meetings for RA2:

- We would like to have once-a-year F2F meeting for RA2 ideally coupled to the official CmF meeting. Options include booking a half-day either before or after the CmF meetings to review project status if the general CmF meetings already do not have this on agenda.

## Mailing lists:

- **RA2 mailing list:** If you wish to receive news about RA2, please subscribe to the mailing list ([cmf-ra2@listen.uni-bonn.de](mailto:cmf-ra2@listen.uni-bonn.de)). If you see your colleagues missing just share the link with him/her/them.
- **CFTs mailing lists:** CFT leads will be responsible for creating these and kick-starting the meetings