DRD1 co-spokesperson candidates presentations

Piotr Gasik

08.12.2023

Scientific biography

2007 – 2011: PhD at the **University of Warsaw, Poland**

- **FOPI Collaboration**
- PhD in Physics: *"Study of nuclear matter properties using strange particles: the analysis of Al+Al collisions at 1.9A GeV"*

2012 – 2020: Research Assistant at the **Technical University of Munich, Germany**

- **ALICE & RD51 Collaborations**
- ALICE TPC Upgrade: development of full-size prototypes, TDR editor, readout chambers production coordinator
- R&D with MPGDs with focus on a detector performance and stability against electrical discharges
- Supervisor to 10 BSc and 4 MSc theses, mentor to 3 PhD students

2019 – 2020: Scientific Associate at **CERN, Switzerland**

- **ALICE TPC Upgrade**: installation manager
- R&D on new electrode materials for gaseous detectors

2020 – … : Staff physicist at **GSI/FAIR, Darmstadt**

- **CBM Technical Coordinator**
- **RD51 WG2 Convener** (2023)
- R&D on spark-less amplification microstructures, resistive layers, TPCs

2021 – … : Guest lecturer at the **TU Darmstadt**

- **Habilitation in experimental physics:** *"Discharge phenomena in Micro Pattern Gaseous Detectors"*

DRD1 biography

Working Group 2 convener (Jan. 2023)

- Contact person & organizer for the WG
- Survey analysis
- Contribute to the proposal drafting
- Definition of Work Packages

Working Groups Conveners
WG1: P. Colas, I. Deppner, L. Moleri, F. Resnati, M. Tygat, P. Wintz
WG2: G. Aielli, , D. Gonzalez Diaz, R. Farinelli, F. Garcia, P. Gasik, F. Grancagnolo, G. Pugliese
WG3: K. Dehmelt, B. A. Gonzalez, B. Mandelli, G. Morello, D, Piccolo, F. Renga, S. Roth, A. Pastore
WG4: M. Abbrescia, M. Borysova, P. Fonte, O. Sahin, R. Veenhof, P. Verwilligen
WG5: R. Cardarelli, M. Gouzevitch, J. Kaminski, M. Lupberger, H. Muller
WG6: G. Charles, R. De Oliveira, A. Delbart, G. Iaselli, F. Jeanneau, I. Laktineh
WG7: A. Ferretti, R. Guida, G. Iaselli, E. Oliveri, Y. Tsipolitis
WG8: E. Baracchini, F. Brunbauer, M. Iodice, B. Liberti, A Paoloni

Work Package Coordinator (Jun. 2023)

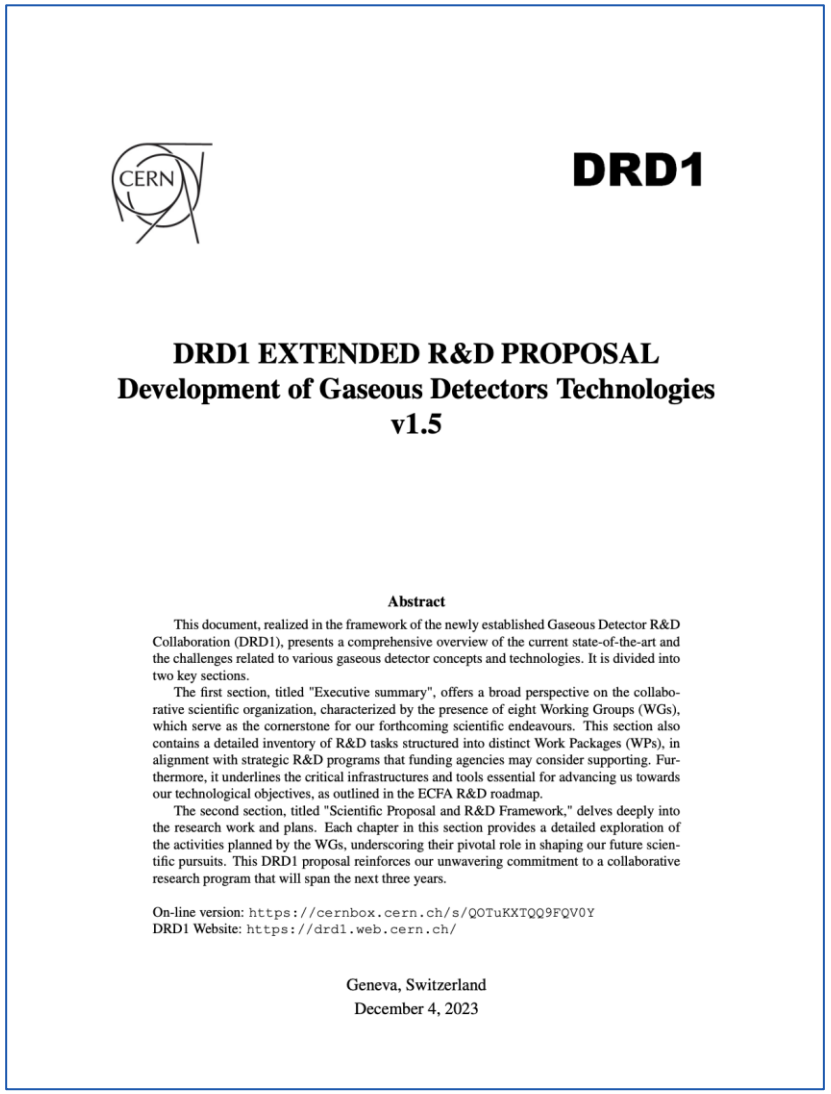
- Extended WP proposal (templates)
- Community meetings
- Several iterations of extended proposals and executive summary tables

Work Package Coordinators
Overall Coordination: P. Gasik
WP1: G. Aielli, R. Farinelli, M. Iodice, A. Ochi, G. Pugliese
WP2: N. De Filippis, F. Grancagnolo
WP3: P. Wintz
WP4: D. Gonzalez Diaz, E. Ferrer Ribas, F. I. Garcia Fuentes, P. Gasik, J. Kaminski
WP5: I. Laktineh
WP6: F. Brunbauer, S. S. Dasgupta, P. Gasik, F. Tessarotto
WP7: F. Brunbauer, I. Deppner, D. G. Diaz, I. Laktineh
WP8: D. G. Diaz, E. Ferrer Ribas, F. I. G. Fuentes, P. Gasik, J. Kaminski
WP9: J. Bortfeldt, G. Croci, D. Varga

DRD1 proposal

- Despite all the challenges, additional requests, last-minute changes and updates, **we have made it!**
- **Great atmosphere** (thanks Leszek and Anna!)

- **Comment on Work Packages**
  - not only tables, tasks, goals, kCHF, and FTEs
  - opportunity to start the collaborative activities, who is doing what, and where. Seed of the collaboration!
  - Note: in many cases, a single WP mixes different technologies!
  - WP coordinators – many thanks for all the great effort!



CERN

DRD1

DRD1 EXTENDED R&D PROPOSAL
Development of Gaseous Detectors Technologies
v1.5

Abstract

This document, realized in the framework of the newly established Gaseous Detector R&D Collaboration (DRD1), presents a comprehensive overview of the current state-of-the-art and the challenges related to various gaseous detector concepts and technologies. It is divided into two key sections.

The first section, titled "Executive summary", offers a broad perspective on the collaborative scientific organization, characterized by the presence of eight Working Groups (WGs), which serve as the cornerstone for our forthcoming scientific endeavours. This section also contains a detailed inventory of R&D tasks structured into distinct Work Packages (WPs), in alignment with strategic R&D programs that funding agencies may consider supporting. Furthermore, it underlines the critical infrastructures and tools essential for advancing us towards our technological objectives, as outlined in the ECFA R&D roadmap.

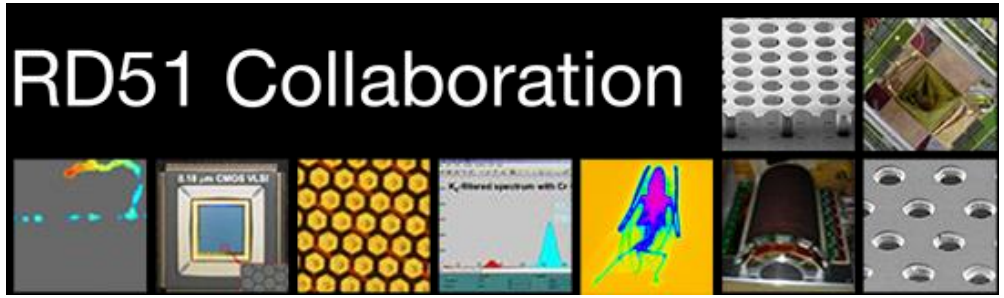
The second section, titled "Scientific Proposal and R&D Framework," delves deeply into the research work and plans. Each chapter in this section provides a detailed exploration of the activities planned by the WGs, underscoring their pivotal role in shaping our future scientific pursuits. This DRD1 proposal reinforces our unwavering commitment to a collaborative research program that will span the next three years.

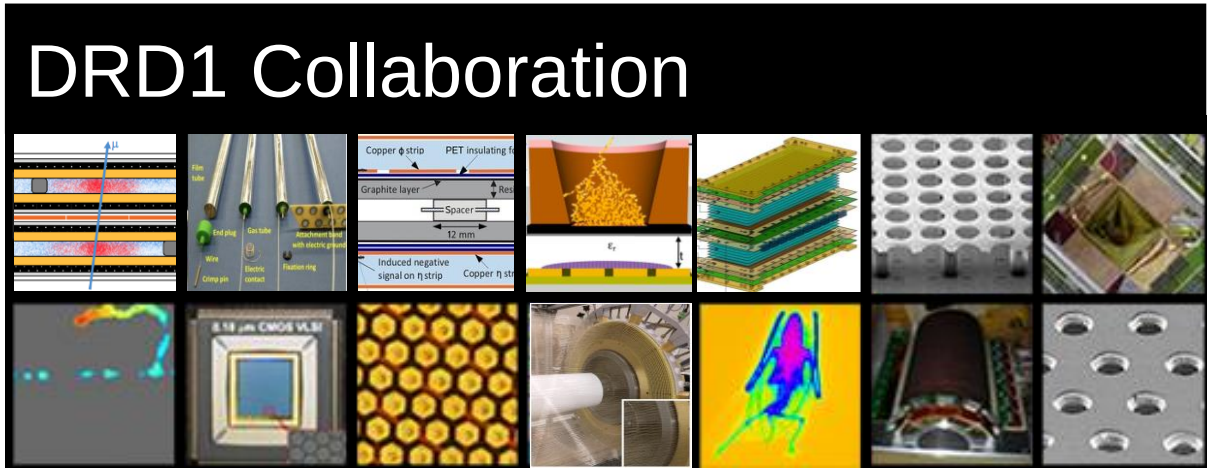
On-line version: https://cernbox.cern.ch/s/QOTuKXTQQ9FQV0Y
DRD1 Website: https://drd1.web.cern.ch/

Geneva, Switzerland
December 4, 2023

TOWARDS DRD1

- I come from the RD51 family and the experience of last year shows that the style in which the RD51 run, can be propagated to the DRD1 family
- Bigger group, more technologies, more tools, more challenges, more members → more fun!

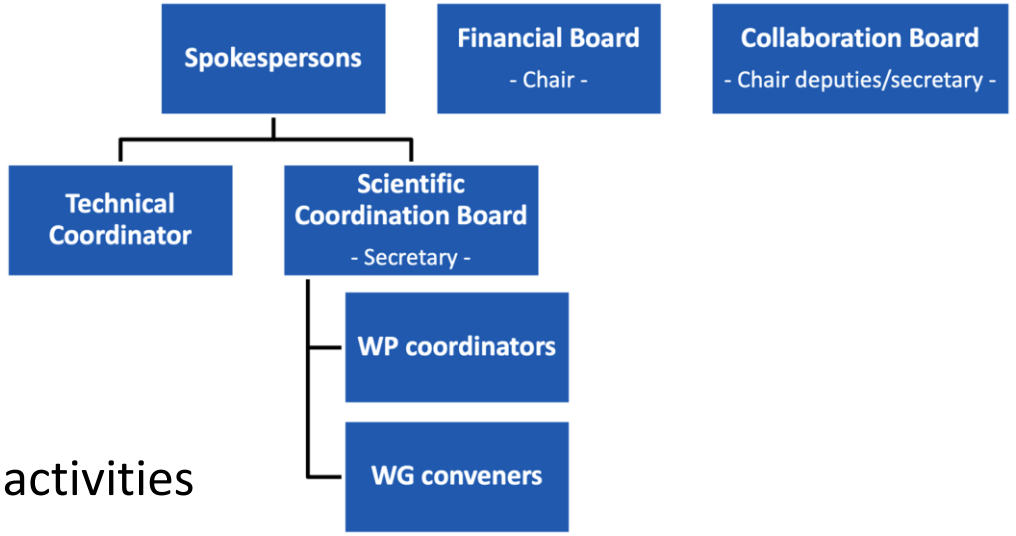




First steps

- Establishment of the management team
- Representation of the entire community
- After one year writing of the proposal, and filling the tables,

  we all would like to continue what is the most important: R&D activities



- In fact, many of these activities are ongoing anyway
- **The idea of collaboration:** build a community which will allow us to work

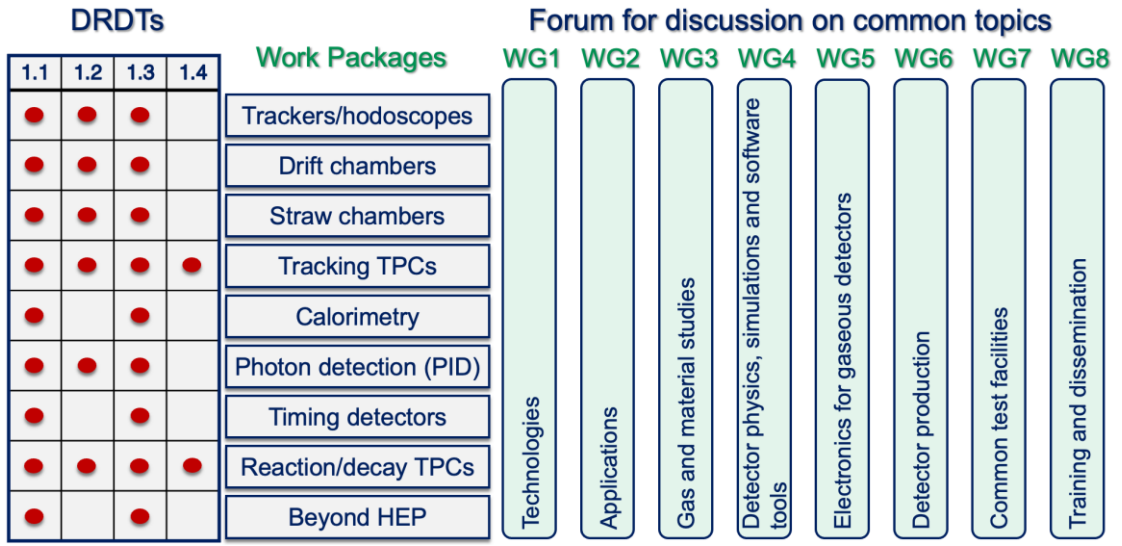
  together in an inclusive and friendly environment, exchange information and

  know-how, develop common tools, and have experts around who can help us.

DRD1 Collaboration

- Several communities → one structure
- Several communities → everybody is welcome on board!

- A lot of common challenges in all technologies:
  - In R&D but also when integrating different technologies within a single experiment
  - Common developments (see next slides)
- No need to split into sub-WGs, sub-DRD1s
  - We anyway continue working on our technology developments
  - We discuss them together and try to find synergies!
  - See WP: merging several technologies in single application developments



Gaseous detector community @ Ageing '23

Common activities

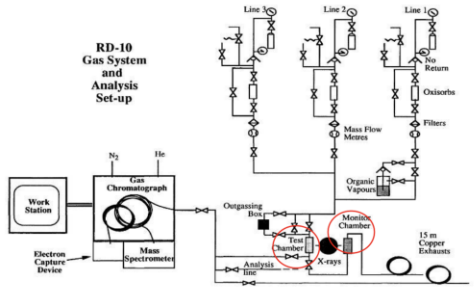
DRD1 will foster common activities:

- Common projects between institutes
- Common investments of several users
- Common beamtimes (WG7)
- **Common developments for several technologies,** such as software (WG4), gas/material databases (WG3), and testing infrastructure (WG7), have been discussed **since the very first community meeting**
- Eventually, common activities with **other DRDs** and national R&D programs

Materials Outgassing and Effects on Detectors

https://detector-gas-systems.web.cern.ch/Material%20and%20Standards/pipematerials.htm

https://detector-gas-systems.web.cern.ch/Material%20and%20Standards/elastomer.htm



M. Capeáns: Nucl. Instr. Meth. A515(2003)73.

Table 3
List of investigated epoxy compounds curing at temperatures above 50°C

Source	Epoxy	Curing T (°C)	Outgas	Effect in detector	Global result
CERN/GDD	EPOTECNY E505 SIT	50	YES	NO	OK
HERA-B/TR	EPOTEK H72	65	YES*	NO	OK*
CERN/GDD	AMICON 125	85	NO	—	OK
CERN/GDD	POLYIMIDE DUPONT 2545	65	NO	—	OK
ATLAS/TRT	RUTAPOX 1.20	60	NO	—	OK
CERN/GDD	ARALDITE AW 106	70	YES	—	BAD
CERN/GDD	LOCTITE 330		YES	YES	BAD
CERN/GDD	EPOTECNY 503	65	YES (Silicone)	—	BAD
CERN/GDD	NORLAND UVS 91	50	YES	—	BAD

Table 6
Outgassing tests carried out for some sealants used for fixing small gas leaks in chambers and gas systems

Source	Material	Type	Outgas	Effect in detector	Global result
CERN/GDD	VARIAN Torr-Seal	Solvent-free epoxy resin	NO	NO	OK
CERN/GDD	RHODORSIL CAF4	Caoutchouc Silicone RTV	NO	NO in very small quantities	OK ?
CERN/GDD	DOW CORNING R4-3117 RTV	Silicone based	YES	NO in very small quantities	OK ?
HERA-B/OTR	LOCTITE 5220	Polyurethane-based	YES	—	BAD

Table 9
Outgassing properties of some plastic pipes

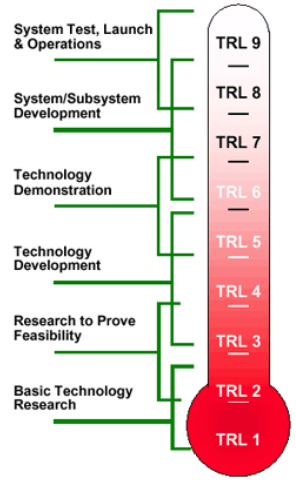
Material	Type	Outgas	Effect in detector	Global result
PP	Polypropylene	NO	NO	OK
RILSAN NYLON	Polyamide	Water	NO	OK*
PEEK Crystalline	Polyetherether ketone	NO	NO	OK
PEEK Amorphous	Polyetherether ketone	YES	—	BAD
PEE		YES	—	BAD
PUR	Polyurethane	YES	—	BAD

3rd International Conference on Detector Stability and Aging Phenomena in Gaseous Detectors – CERN November 6th-10th, 2023

R. Guida – Conference closure and outlook, Ageing 2023

R&D goals

- With this **community-driven** approach → **push the frontiers of gaseous detector technology**
- **Blue-sky** and **Strategic R&D!**



- Use our strength for common grant/funding applications (WP but not only), execute technology transfers, etc.
- Use the fact of being a large collaboration and map possibilities of requesting access to facilities (e.g. beamtimes) at CERN but also **in other collaborating institutes**

- Make sure our results and activities are well-recognized
- Participation in DRD1 must be well-recognised!
  - DRD1 is a large collaboration: ~160 institutes, >700 participants, with the DRD Committee review model (as LHCC) and CERN as a host lab

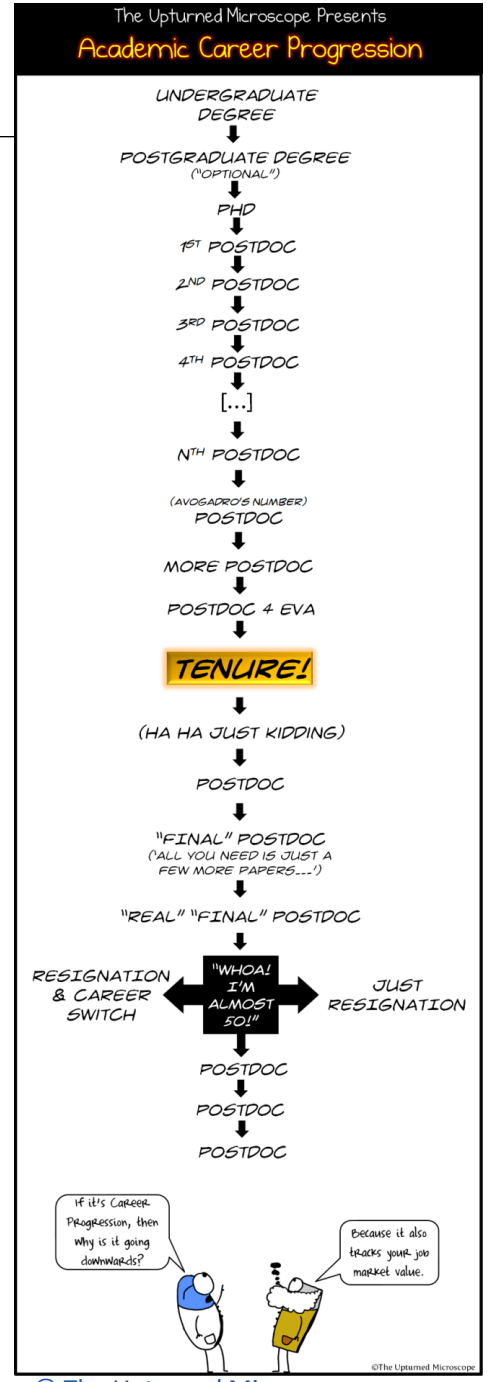
- **A pivotal role of the new co-spokespersons in exploring these opportunities on behalf of the collaboration**

Young researchers @DRD1

Special attention should be paid to the young DRD1 members!

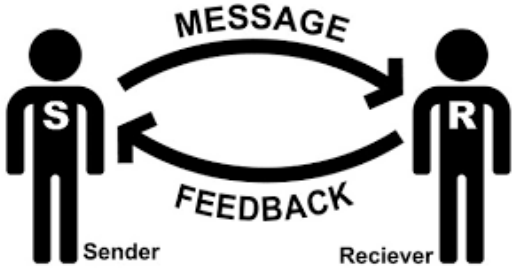
- **Students**
  - Make sure they can present their work and receive valuable feedback!
  - Detector schools (see recent MPGD School example!), topical workshops, hands-on sessions (e.g. on simulations)

- **Post-docs, young researchers**
  - DRD1 - opportunity to reach the next step in the career paths
  - Visibility within and outside the community
  - Rotating conveners of WGs
  - Dedicated common projects for young investigators

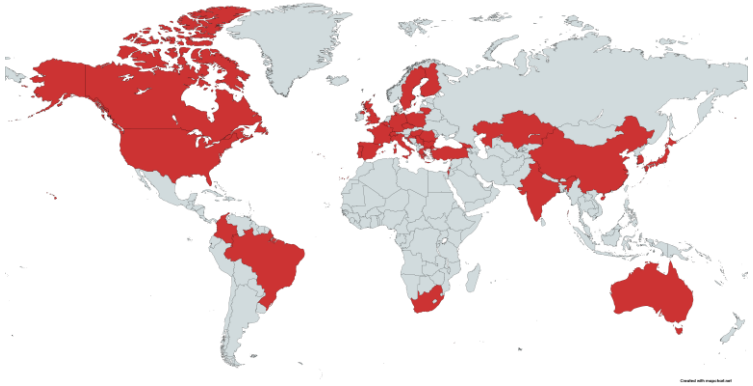


The glue: communication

- Key to successful organisation: **effective communication**
- The co-spokesperson and DRD1 management **represent** the collaboration, **implement** decisions of the CB and **listen** to the collaboration!
- Transparency is of utmost importance!



- Communication within the collaboration: meetings, mini-weeks, workshops
  - Consider the worldwide collaboration: meetings outside CERN
  - Consider the variety of topics and technologies → topical sessions, topical workshops
  - Video participation always available but maximize in-person attendance!
  - Explore additional tools: web, forums, messaging platforms, etc.



Summary

- It is a great honour to receive the nomination for a DRD1 co-spokesperson
- Many of us worked together in the past ~11 months on the proposal preparation

  → **Great seeding experience**
- We are ready to move forward as DRD1 **in January**!
- I am ready to help shape the new collaboration to make the best out of the many challenges ahead of us!

Thank you for your consideration!