ISMA ▪ UCBL ▪ INNO ▪ KT

SUCCESS FP-7 – History, current status and future

(ERA-WIDE project)

A.Gektin

Institute for Scintillation Materials NAS of Ukraine

ERA – European Research Area

The ERA-WIDE activities covered by the call are:

✓Networking with research centers in Member States or Associated Countries in view of disseminating scientific information, identifying partners and setting up joint experiments; (Key mission!)

✓Developing training modules to build competency and facilitate the participation in FP7 of the centers located in the targeted third countries;

✓Developing the research centers' strategy in order to increase their scope (regional coverage, activities) and to improve their responses to the socio-economic needs of their countries and of the region.

See. S.Klessova

THE TEAM (consortium) :

Coordinator: ISMA (Institute for Scintillation Materials, Ukraine) – one of World recognized leader in scintillation physics and engineering

UCBL – University of Claude Bernard Lyon (France) – one of luminescence and material science European leadership centers

Inno TSD (France) – well known European consulting company in the field of innovation and science

KT (Ukraine) – Ukraine consulting company 13 years experience in the innovation and international project promotion and development



MAIN ACTIVITIES :

✓**Analysis:** strategy of the cooperation between ISMA and EC scientific and R&D centers on the base on SWOT analysis.

✓**Twinning activity:** scientific cooperation of ISMA and UCBL (mutual scientific projects, European workshops and conference management, scientists exchange, access to European scientific facilities

✓ **International cooperation:** scientific&development promotion, use of European "technology platform" and European scientific facilities integration to EC programs in favor of later FP7 progress.

✓**Education and training activity:** students and PhD study, general educational activity, cooperation with EC universities

EC motivations , criteria and implementations…

See in details S.Klessova & O.Kiffer

* Synergy from cooperation

* Efficient use of scientific capacities, European facility first of all

• Strong cooperation of ES and Associated Countries

• European priorities for advance science

• Background strengthening for European industry use…?
Bridge between result and future technology

* Implementation ! (Industry, medicine, security etc)

Questions we have to reply at the beginning

1. Is "our science" perfect enough or claim for basic renew? Core problem? Ways for upgrade?

2. Can **we (all together)** upscale the physics to the next level? What has to be done in this favor? Can we add some more ideas if necessary?

3. Science and management… What we need to create "efficient" scientific team (financial and management support)?

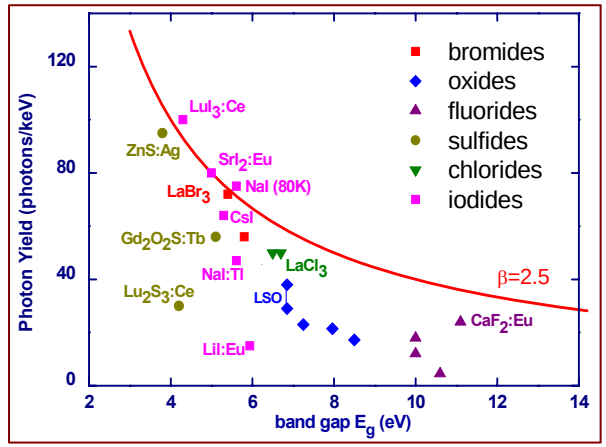
4. Next steps provision? (Planning, information exchange, meetings, promotional policy)

Is "our physics" perfect and predictable?
(Fundamental limits to the yield)

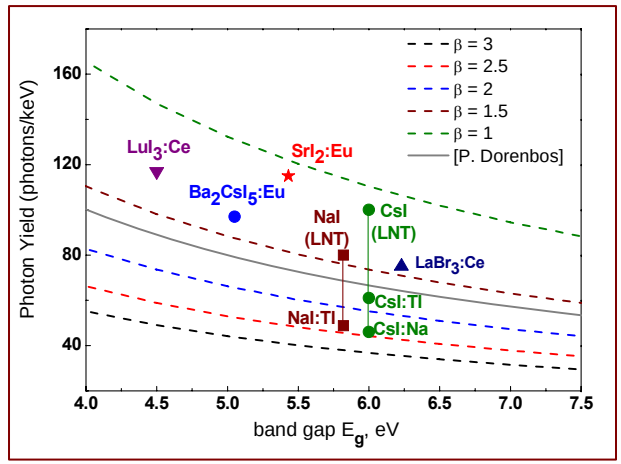
$$N_{ph} = \beta S Q$$

$$\beta = \frac{E_\gamma}{E_{e-h}}$$

- E_γ gamma-ray energy
- E_{e-h} = ~ 2.5 E_g
- **S** transport/transfer efficiency to LC
- **Q** quantum efficiency of LC



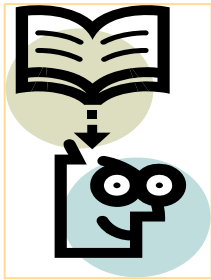
P.Dorenbos, 2009

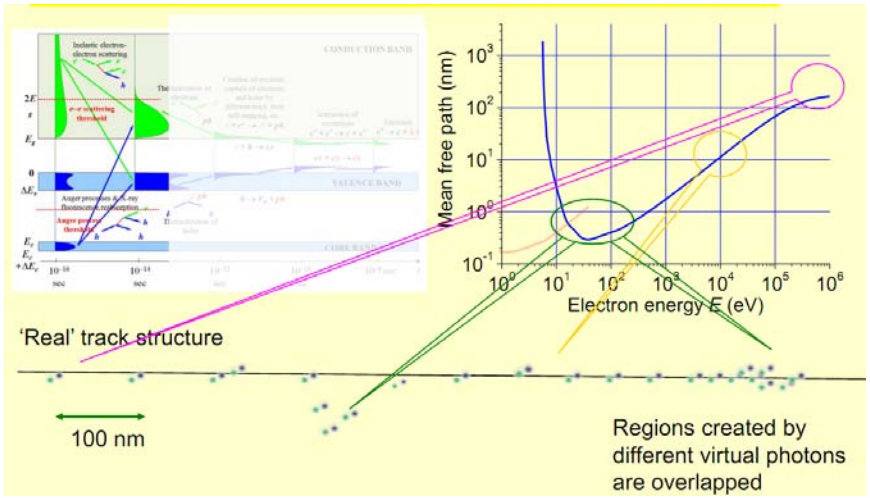


Constatation. **After 20 years of use new stage of scintillation science upgrade is an actual!**

Question. **What we can propose ?**

New project core – physical model

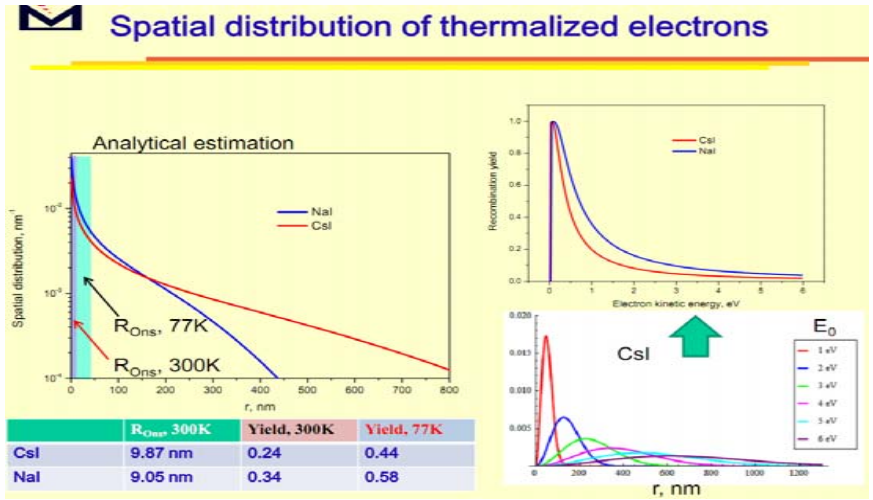




We have to study the track development with more details !

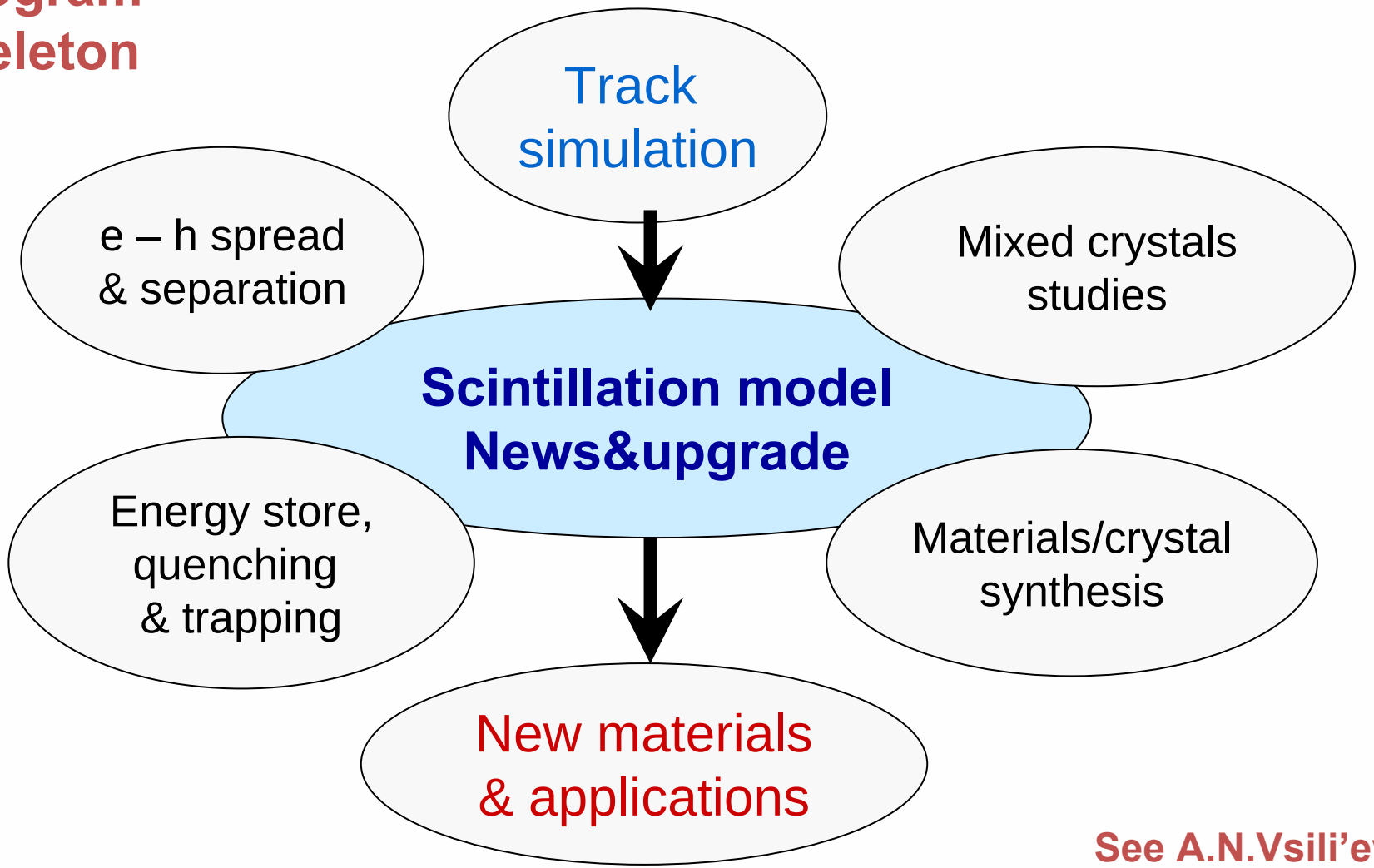
See in detail at:

A.Vasili'ev
A.Belsky
A.Lushchik
C.Dujarden

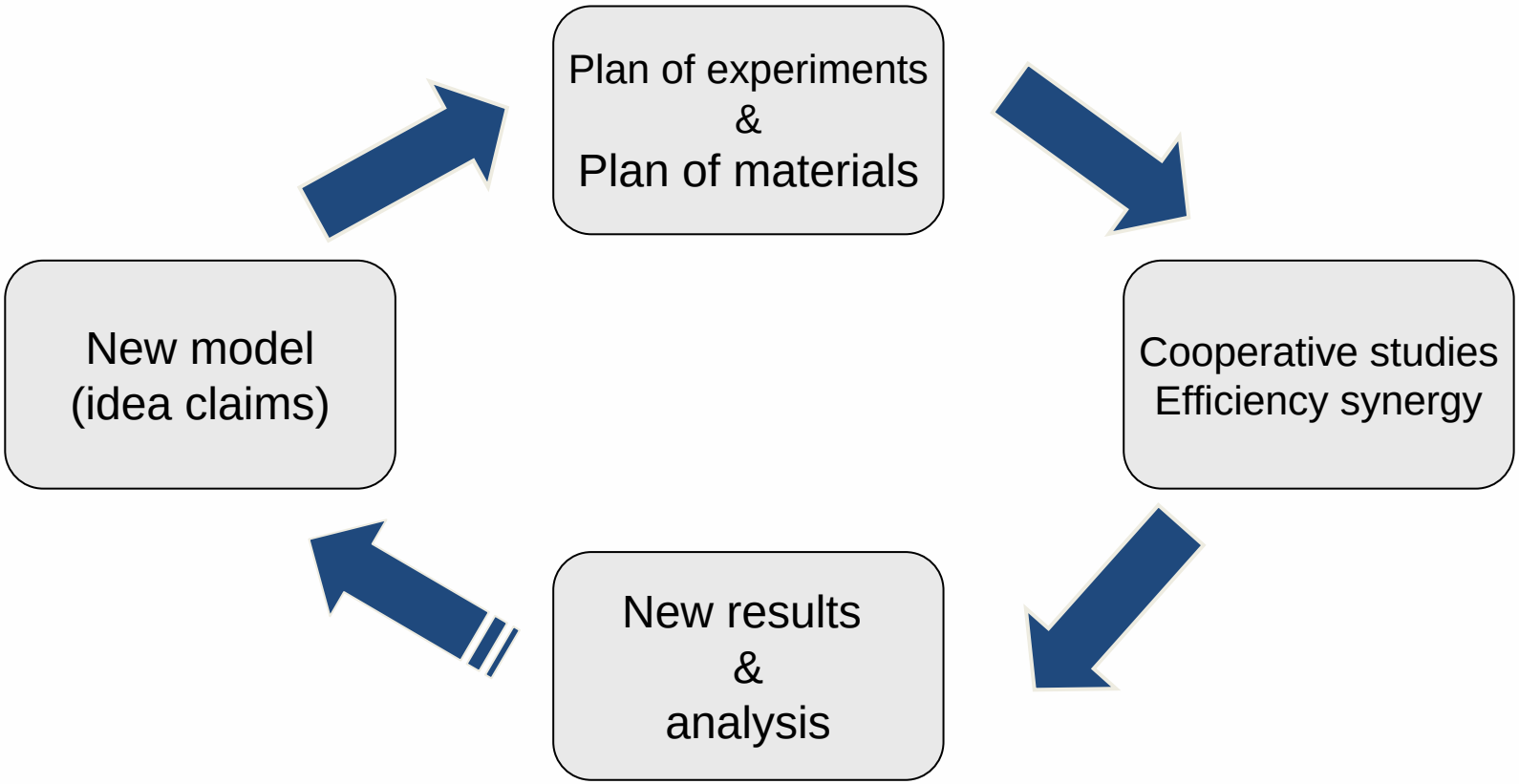


	R_{Ons}, 300K	Yield, 300K	Yield, 77K
CsI	9.87 nm	0.24	0.44
NaI	9.05 nm	0.34	0.58

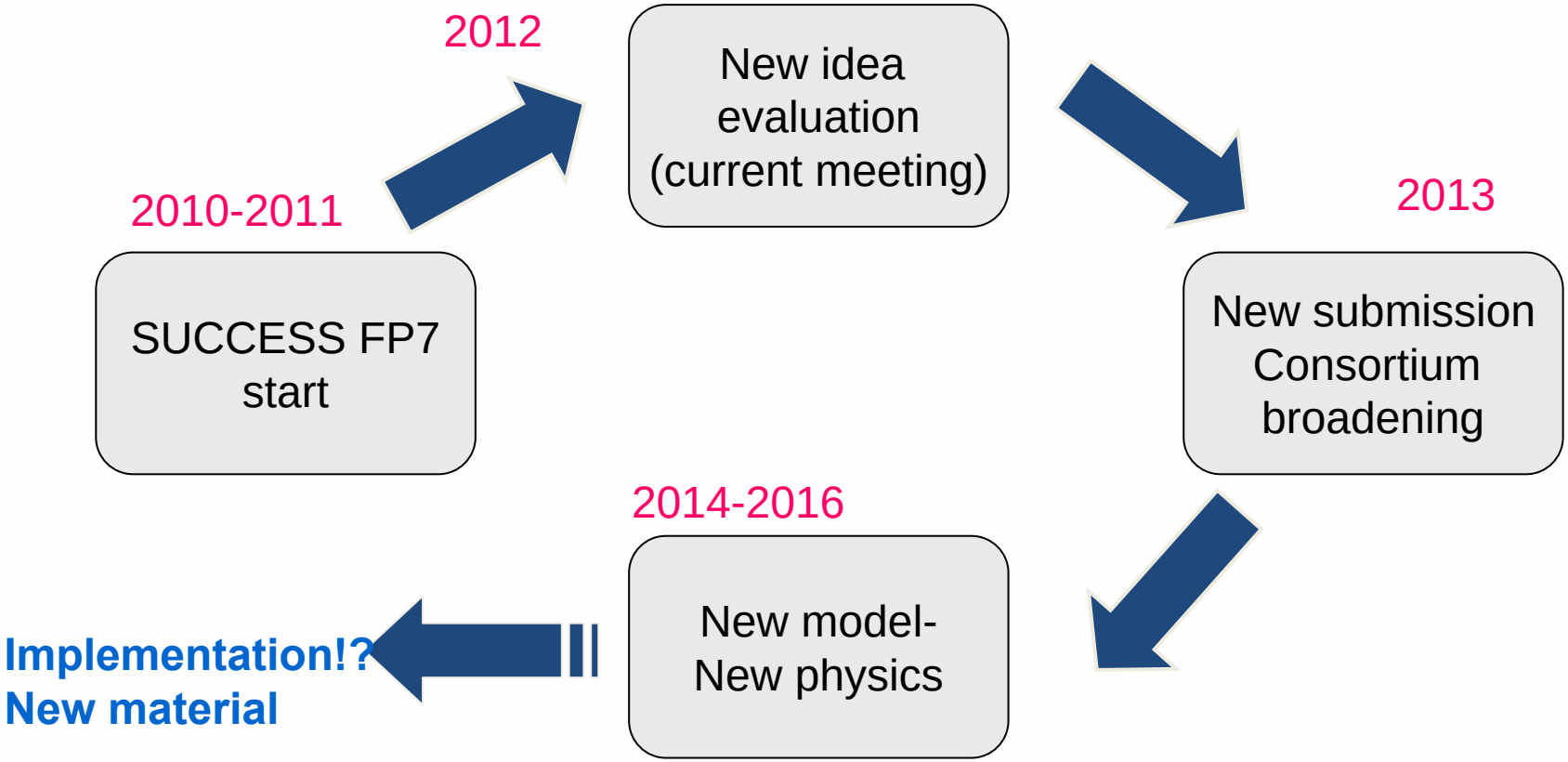
Program skeleton



See A.N.Vsili'ev



Internal cooperation and synergy



From idea to results and implementation !

Few notes (as an examples) …

Few notes (as an examples)

1. Competitive landscape

US "competitive landscape"

National laboratories

Lawrence Livermore National Laboratory

Berkeley Lab

Pacific Northwest National Laboratory

SORMA WEST
May 14, 2012,
Oakland, CA

Universities

The University of Tennessee Knoxville

Duke University

Fisk University

Wake Forest University

Companies

SAIC

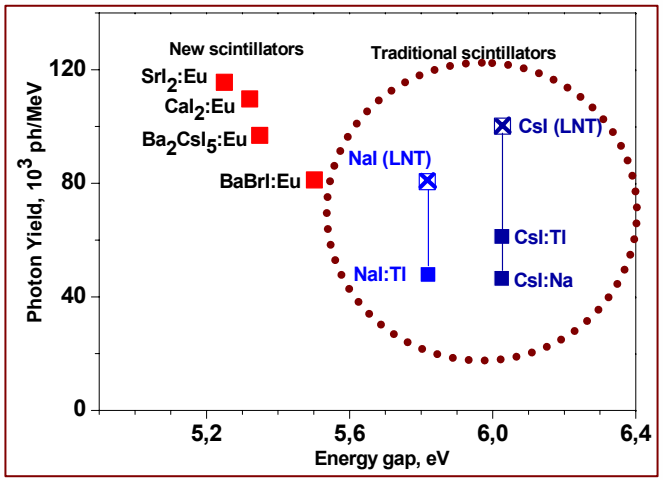
RMD
A Dynasil Company

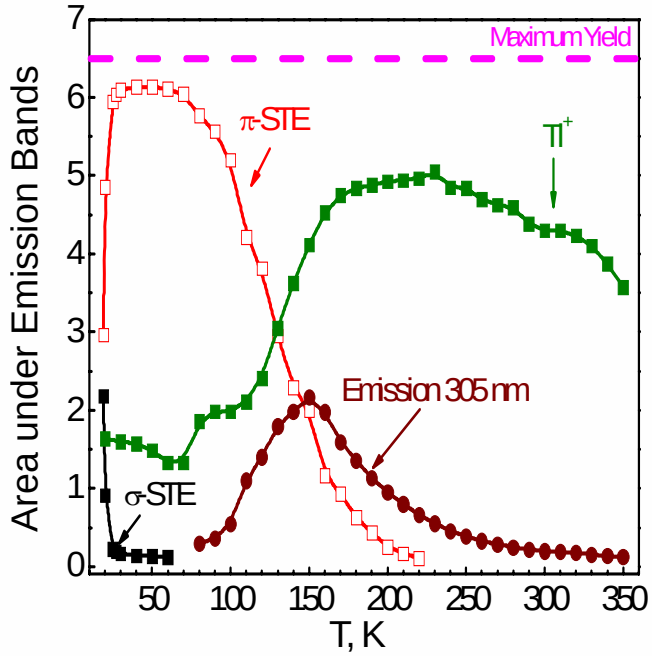
Few notes (as an examples)

1. Competitive landscape
2. Pass from quality to quantity radioluminescence study

Pass from quality to quantity radioluminescence study

Crystal	E_g, eV	LY, ph/Mev theor.	LY, ph/Mev expim.
NaI (77K)	5.8	*86.000*	**80.000**
NaI:Tl (RT)			45.000
CsI (77K)	6.1	*82.000*	**~100.000**
CsI:Tl (RT)			56.000
CsI:Na (RT)			46.000





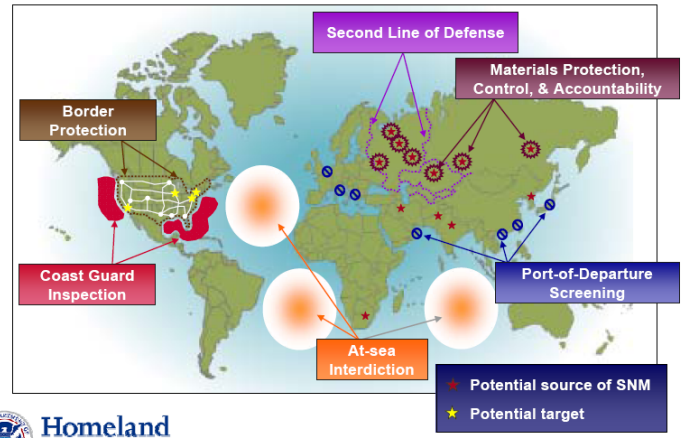
Few notes (as an examples)

1. Competitive landscape
2. Pass from quality to quantity radioluminescence study
3. Energy store
4. Density effects (quenching)
5. Materials and media
6. Crystals as an objects for study
7. New material developments and implementation

Strategy of materials search

- → *Serendipity*
- → *Search and errors «cook and look»*
- → *Back grounded selection*

Implementation



Homeland Security

Next potential steps (announce, promotion, meetings):

(To the Round Table discussion)

- SCINT-13 promotion …? April 13
- Virtual laboratory (VL) experiments planning and info exchange
- Mutual publications?
- Broad meeting (EC support in frame of SUCCESS conference in Ukraine)
- Call and proposal submission (INNO)
- IEEE NSS/MIC promotion? Nov 13

Current meeting main goal
(To the Round Table discussion)

Questions we have to reply to our self at first and in project secondly

1. **Is new idea good enough to upscale scintillation model to higher level?**
2. **Can we properly plan the list of experiments? Can we add some more ideas if necessary?**
3. **Are we sure that can (all together) resolve all problems? Do we have enough resources and capacity?**
4. **Do we have a goodwill to take a part in new consortium?**

Thank you for attention!