

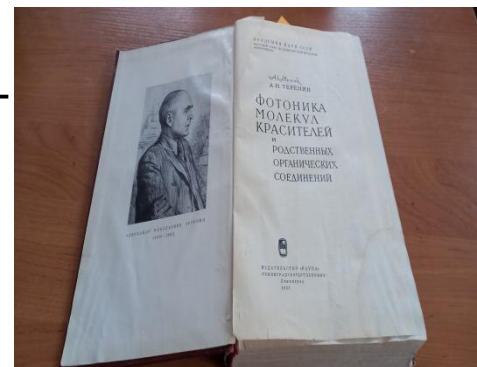
Tomsk State University, Tomsk
The first Russian university on the territory of
Russian Asia, 1878



Speaker – Lubov Samsonova



Prilezhaeva Nataliya Aleksandrovna – the best Terenin's scholar, in 1935 arrived in Tomsk and headed the laboratory of spectroscopy in Tomsk State University



Today:
Photonics and Organic Electronic Laboratory



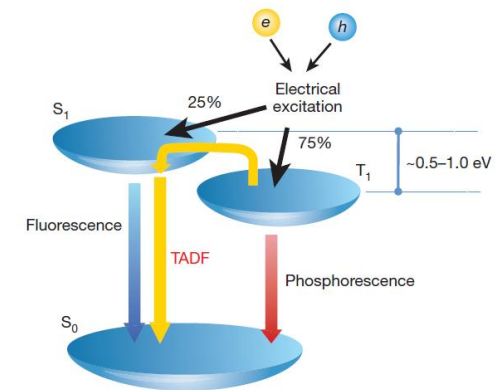
Research directions:

- Organic light emitting diodes and transistors
- Printed Electronics
- Laser-active media of tunable dye lasers
- Optical molecular sensors

Luminescent of organic molecules under photo- and electro-excitation

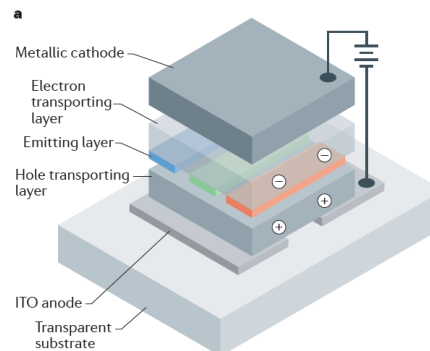
Key words: Organic light-emitting diodes (OLEDs), prompt fluorescence (PF), thermally activated delayed fluorescence (TADF), phosphorescence (Ph), reverse intersystem crossing (RISC).

According to quantum statistics, 75% of the created excitons are in the triplet state and only 25% are in the singlet. Harvesting both singlet and triplet excitons, an IQE of nearly 100% can be achieved



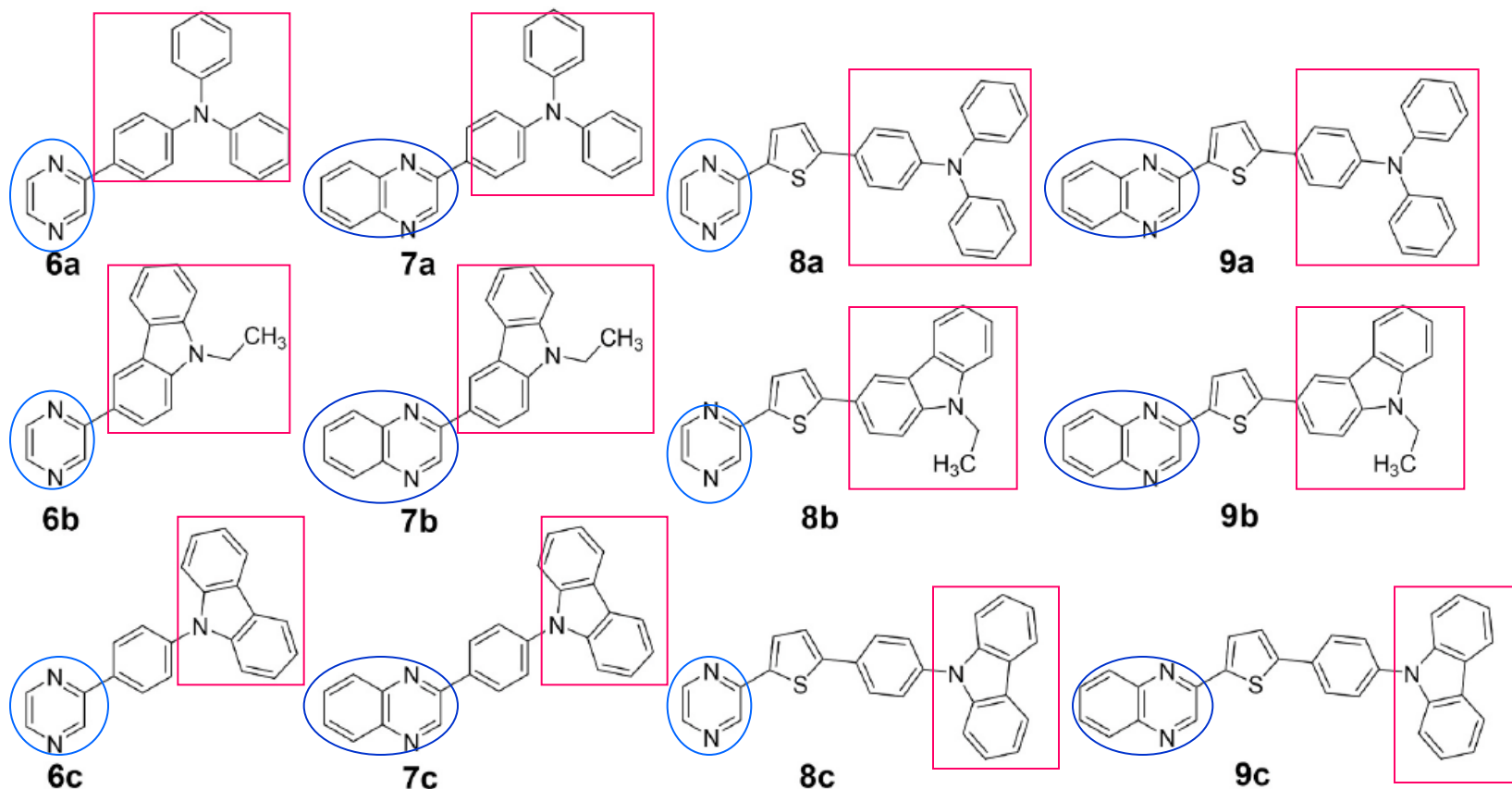
H.Uoyama, K.Goushi, K.Shizu, Hiroko Nomura, C. Adachi //

NATURE. VOL 492, 234-238, 2012



$$k_{\text{RISC}}^T \propto \exp(-\Delta E_{\text{ST}}/k_{\text{B}}T)$$

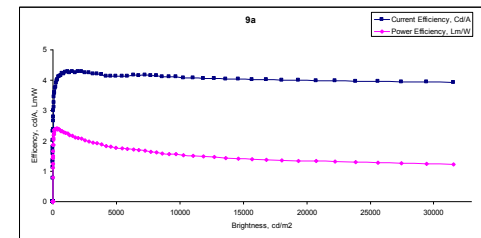
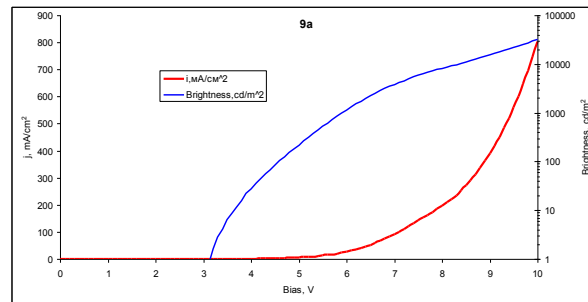
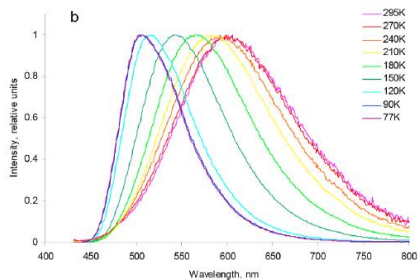
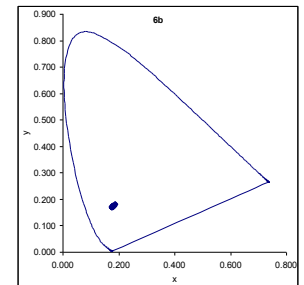
D–(π)–**A** structures are useful for developing high-efficiency emitters, because such push–pull systems usually show strong ICT emission



pyrazine and quinoxaline are electron acceptor units;
triphenylamine and carbazole are electron-donating units

Results

- Spectra of prompt and delayed fluorescence, phosphorescence in solutions and neat films;
- solvate -fluorescent properties;
- electroluminescence and its efficiency
- *can be found in*
- Dyes and Pigments 187 (2021) 109124
- Journal of Photochemistry & Photobiology, A: Chemistry 408 (2021) 113089



This work was supported by The Tomsk State University competitiveness improvement program under grant No. 8.1.38.2020.