

Luminescent complexes for optoelectronics

LMCO group

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https://vk.com/lmco_group

<https://colab.ws/labs/461>



Team 2024

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Paderina Aleksandra, PhD student
Grachova Elena, professor
Abramova Evgeniya, fellow student
Ekaterina Dracheva, bachelor
Safronova Stefania, bachelor

Research

Design and synthesis of luminescent complexes of transition metals, both mono- and polynuclear, and control assembly of highly organized supramolecular systems

Prediction of the probability of intra- and intermolecular interactions

Ligand environment design

Metal selection

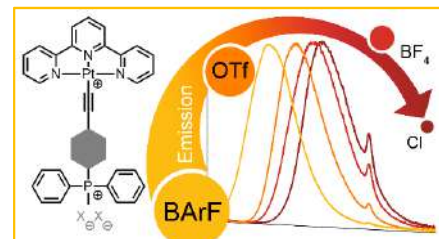
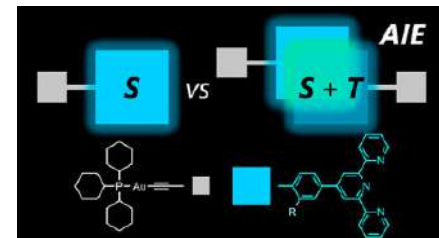
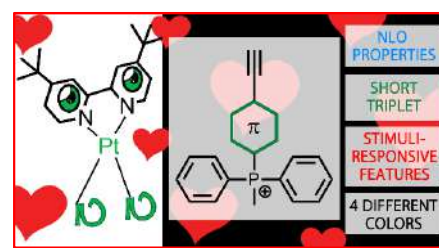
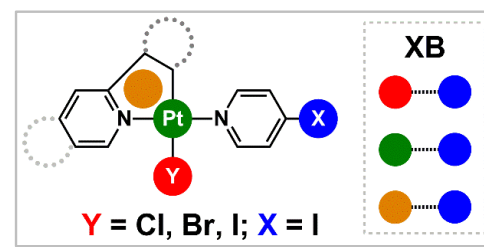
Introduction of functional groups to the periphery of the ligand environment



Complex of given composition and spatial structure



Functional supramolecular system



Applications

pH measurement
and oxygen mapping at
the micro- and nanoscale

Singlet oxygen generation

Preparation of nanohybrid
composites

Photo catalysis

Temperature
measurement of micro-
and nano-objects

Nanoparticle tracking

Flaw detection at the
micro- and nanolevel

Stimuli Responsive
materials

Determination of the
concentration of ions in a
solution

Photonics

Creation of luminescent
materials

Creation of electro-
luminescent devices

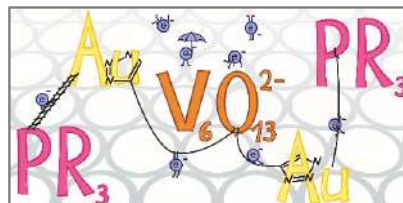
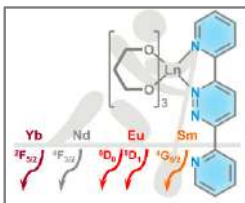
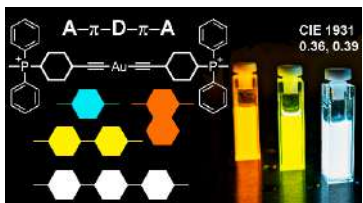
White light generation

Molecular electronics

Solar energy conversion

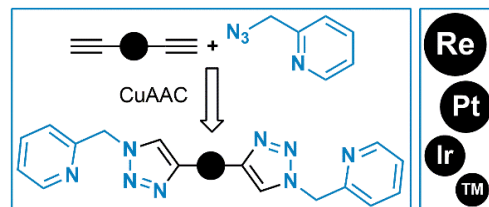
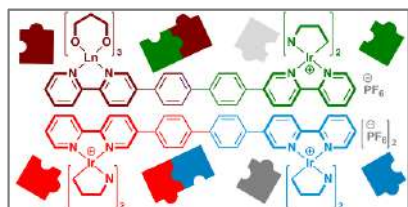
Light conversion and
harvesting

Methods and instruments



Inorganic synthesis

Organic synthesis



NMR spectroscopy

Mass-spectrometry

FTIR spectroscopy

Single crystal XRD and
PXRD

XPS spectroscopy

UV-vis spectroscopy

Fluorescence spectroscopy

Partners and cooperation



General and Inorganic
Chemistry division

Physical Chemistry
division

Analytical Chemistry
division

Polymer Chemistry
division

Physical Organic
Chemistry division



ITMO, International Research
Center for Nanophotonics and
Metamaterials (New PhysTech)

Center for Collective Use
'Analytical Center for Nano- and
Biotechnologies of SPbPU'

Razuvaev Institute of
Organometallic Chemistry, RAS



Financial support

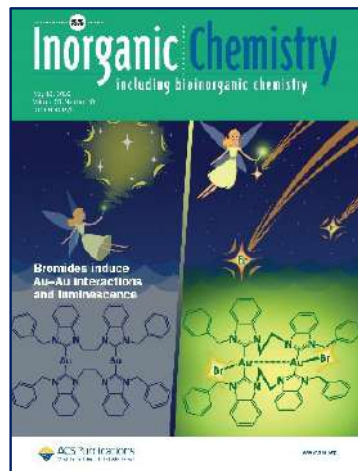
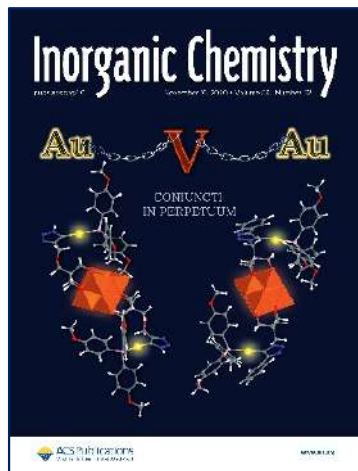
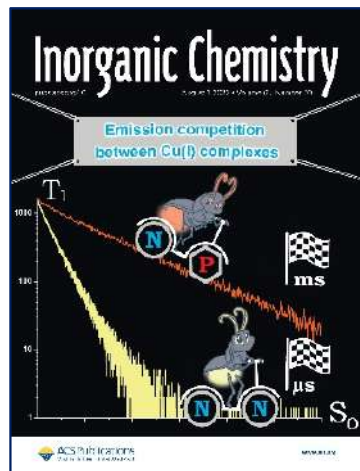
RSF grant 24-13-00024 'Luminescent complexes of transition metals based on organophosphorus ligands'



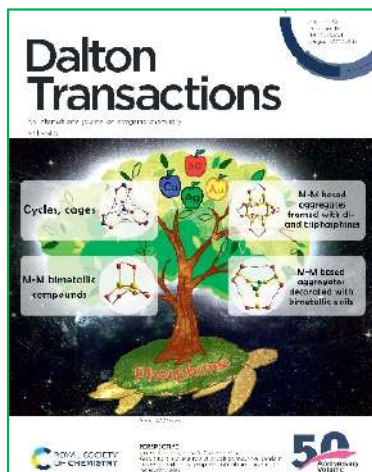
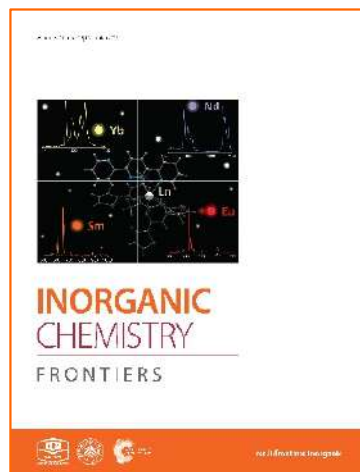
**Russian
Science
Foundation**



Publications



Chemical Science
Inorganic Chemistry Frontiers
Molecular Systems Design & Engineering
Dalton Transactions
CrystEngComm



Inorganic Chemistry
The Journal of Physical Chemistry C
Organometallics

Angewandte Chemie IE
Chemistry A European Journal
ChemPlusChem
European Journal of Inorganic Chemistry

Dyes and Pigments
Molecules