

ИЗБОРНОМ И НАСТАВНО-НАУЧНОМ ВЕЋУ  
ФИЗИЧКОГ ФАКУЛТЕТА УНИВЕРЗИТЕТА У БЕОГРАДУ

На IX редовној седници Изборног наставно-научног већа Физичког факултета Универзитета у Београду одржаног 28. јуна 2017. године, одређени смо у Комисију за припрему извештаја по расписаном конкурс за избор једног РЕДОВНОГ ПРОФЕСОРА за ужу научну област ПРИМЕЊЕНА ФИЗИКА на Физичком факултету Универзитета у Београду. У том својству подносимо Већу следећи

## РЕФЕРАТ

На конкурс за избор једног РЕДОВНОГ ПРОФЕСОРА за ужу научну област ПРИМЕЊЕНА ФИЗИКА на Физичком факултету Универзитета у Београду, који је објављен у листу Националне службе за запошљавање „ПОСЛОВИ“ од 19.07.2017. године, јавио се један кандидат, др Бећко Касалица, ванредни професор Физичког факултета Универзитета у Београду.

### БИОГРАФИЈА, НАСТАВНА И НАУЧНА АКТИВНОСТ КАНДИТАДА

#### 1. Основни биографски подаци

Проф. др. Бећко Касалица је рођен у Цетињу 14.07.1961. године. Основну школу и гимназију је завршио у Цетињу. Дипломирао, специјализирао, магистрирао и докторирао на Физичком факултету Универзитета у Београду. Дипломирао је на смеру Експериментална физика, 1989. године са темом „*Осцилаторни спектри двојних фосфата кобалта*“ на Физици чврстог стања код проф. Милене Напијало. Специјализирао 1995.

год. са темом *"Оптичке особине двојног сулфата магнезијума и кобалта  $MgCo(SO_4)_2$ "* на Физици чврстог стања код проф. Милене Напијало. Магистрирао је 1997. године са тезом *"Испитивање галванолуминесцентних ефеката на оксидним слојевима добијеним анодизацијом алуминијума у оксалној киселини"* на Примењеној физици код проф. Љубише Зековића. Докторирао је 2006. год. са дисертацијом *"Динамика луминесцентних процеса танких оксидних слојева добијених анодизацијом алуминијума"* на Примењеној физици код проф. Љубише Зековића.

Од 1992. године до 1997. године. др. Бећко Касалица је радио као стручни сарадник на Физичком факултету Универзитета у Београду. Од 1997. године кандидат ради као асистент на истом факултету на предметима Термотехника, Електрична мерења и Метрологија.

Од 2007. године. др. Бећко Касалица ради као доцент на Физичком факултету Универзитета у Београду на предметима Геометријска оптика и оптички инструменти, Мерни контролни системи у индустрији и енергетици, Акустика и Термотехника (од 2012).

Од 2013. године. др. Бећко Касалица ради као ванредни професор на Физичком факултету Универзитета у Београду на предметима: Термотехника, Метрологија, Метрологија и стандардизација, Геометријска оптика и оптички инструменти и Акустика.

## **2. Наставна активност**

Као асистент на Физичком факултету у Београду др Бећко Касалица је учествовао у извођењу наставе на следећим предметима студентима физике: Метрологија, Метрологија и стандардизација и Електрична мерења. После избора у звање доцента држи експерименталне вежбе на предметима Метрологија, Метрологија и стандардизација, Електрична мерења, као и предавања на предметима: Геометријска оптика и оптички инструменти, Мерни контролни системи у индустрији и енергетици, Акустика, и Термотехника (од 2012). У периоду избора у звање ванредног професора држи: експерименталне вежбе на предметима Метрологија, Метрологија и стандардизација (до 2015), Електрична мерења (до 2016), као и предавања на предметима: Термотехника,

Метрологија (од 2016), Метрологија и стандардизација (од 2016), Геометријска оптика и оптички инструменти и Акустика. На докторским студијама је ангажован на предмету Мерење ниских светлосних интензитета. Проф. др Бећко Касалица је коаутор Универзитетског уџбеника “Увод у акустику” ИСБН 978-86-84539-18-4. Проф. др Бећко Касалица руководио је израдом једне докторске дисертације, а тренутно је ментор докторских студија за три кандидата.

### **3. Научна активност**

#### **3.1. Публикације**

Резултати научног рада др Бећка Касалице су публиковани у 31 раду у међународним часописима (ИФ > 1), од тога 4 након предходног избора<sup>1</sup>. Такође је имао велики број саопштења на међународним скуповима и скуповима националног значаја који су штампани у целини или у изводу. Укупан импакт фактор публикованих радова је 79.084. Број цитата наведених радова без аутоцитата и цитата коаутора је преко 283, а са цитатима коаутора преко 392<sup>2</sup>.

#### **3.2. Учесће на научним пројектима и међународна сарадња**

Др Бећко Касалица је био учесник више научноистраживачких и иновационих пројеката Министарства за науку: “Луминесцентна и фототермална својства ласерских кристала под високим притисцима, оксидних филмова, полупроводника и биолошких система” (2002-2004), “Оптичке, механичке и проводне особине нанотуба” (2004-2005), “Пирометарски систем за мерење и контролу температуре загрејаних тела са компензацијом утицаја зрачења околине” (2005-2006), “Пирометарски фиброоптички систем за мерење и контролу просторне расподеле температуре у ложиштима котлова термоелектране Никола Тесла” (2006-2007), “Угљеничне и неорганске нанотубе” (2006-2010). Поред тога кандидат је био и на ФПБ пројекту “Reinforcing nanostructure laboratory” (2007-2008). Тренутно ради на пројекту “Графитне и неорганске наноструктуре ниске димензионалности” (од 2011).

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<sup>1</sup> Након објављивања конкурса и у току писања овог реферата кандидат је објавио још један рад у водећем међународном часопису.

<sup>2</sup> Scopus 11.09.2017.

#### 4. Преглед научних резултата

Научна активност др. Бећка Касалице одвија се у оквиру две засебне целине: **физике кондезованог стања материје и примењене физике**. У области кондезованог стања кандидат се бави истраживањем оксидних слојева добијених анодизацијом „вентилних метала“ у погодним електролитима, са посебним освртом на њихове луминесцентне феномене. Кандидат је посебан допринос дао у пројектовању и изградњи широкопојасних оптичко-детекционих система за испитивање динамике луминесцентних процеса у току саме анодизације. У области Примењене физике др. Бећко Касалица се бави метрологијом температуре и светлосних величина. Кандидат је учествовао у пројектовању и изради радијационих пирометара секундарних и радних еталона температуре, чијом реализацијом Лабораторија за оптичку пирометрију Физичког факултета Универзитета у Београду постала акредитована од стране АТС-а (Акредитационо тело Србије) за преглед и еталонирање мерила температуре. Кандидат је такође учествовао у формирању Лабораторије за спектрофотометрију Физичког факултета Универзитета у Београду која је акредитована од стране АТС-а за преглед и еталонирање спектрофотометара, фотометара ЕЛИСА читача, биохемијских анализатора и атомских апсорпционих спектрофотометара.

Др Бећко Касалица се бави проучавањем оксидних структура које се добијају анодизацијом алуминијума као и других „вентилних метала“. Значајне технолошке апликације су довеле до константног раста интересовања за ове оксидне структуре, које су једне од структура које се највише проучавају у оквиру науке о материјалима, физике чврстог стања. Најважнији допринос Др Бећка Касалице је у разумевању природе галванолуминесцентних феномена као и феномена плазма електролитичке оксидације.

У последње време кандидат углавном се бави проучавањем, феномена Плазма електролитичке оксидације (ПЕО), као и спектрофотометријским мерењима везаним за оптичко-детекционе системе, оптичку пирометрију и биофизику.

ПЕО вентилних метала и оксидних структура које се добијају овим процесом у разним електролитима имају изванредну отпорност на хабање, трење, корозију, термичке и електричне особине што чини ове површине погодним за примену у текстилној

индустрији, ваздухопловству, аутомобилској индустрији, биомедицинским уређајима итд. У својим истраживањем ПЕО феномена користи се методама: оптичке емисионе спектроскопије, електронске микроскопије (СЕМ), микроскопом атомских сила (АФМ) и анализом процеса у реалном времену. Добијени резултати су дали значајан допринос разумевању ПЕО феномена, а такође је показано да је оптичка емисиона спектроскопија веома погодна техника за карактеризацију плазме која се јавља у току електролитичке оксидације. Посебна пажња је посвећена карактеризацији оксидних структура које би се добиле анодизацијом вентилних метала (Al, Ti, Ta).

Нови приступ спектрофотометријским мерењима као и њихова анализа, могу се применити у оптичкој пирометрији, као и за проучавање феномена у биофизици.

### **Приказ радова публикованих у водећим међународним часописима**

#### ***1. LED-based Vis-NIR spectrally tunable light source - the optimization algorithm***

У раду [1] представљена је аналитичка метода за одређивање доприноса изабраних ЛЕД диода као извора светлости у опонашању спектра „црног тела“ и њихову примену у оптичкој пирометрији.

#### ***2. The mechanism of evolution of microdischarges at the beginning of the PEO process on aluminum***

У раду [2] представљен је нови приступ механизму ПЕО, који је по својој природи сложен физичко-хемијски процес, који још увек има велики број непознаница.

#### ***3. Investigation of long-duration plasma electrolytic oxidation of aluminum by means of optical spectroscopy***

У раду [3] је испитивана ПЕО алуминијума после вишечасовног ПЕО процеса. Анализом спектралних линија алуминијума, одређена је температура плазме, око 8000 К на почетку процеса, а након 60 минута од почетка процеса 3000–4000 К. Састав плазме која садржи алуминијум, кисеоник, водоник и натријум, под претпоставком локалне топлотне равнотеже, израчунат је за температуре до 11000 К, да би се објасниле добијене спектралне карактеристике.

#### ***4. Galvanoluminescence of oxide films during the anodization of titanium***

Истраживања публикована у раду [4] испитују луминесценцију тантала у режиму константне струје у воденим растворима фосфорне и оксалне киселине. Слаба анодна луминесценција у току анодизације је повезана са постојањем дефеката у формираним оксидним слојевима. Показано је да интензитет луминесценције расте са порастом дефеката на анодизованим узорцима тантала, повећаном густином струје и температуром електролита. Добијени луминесцентни спектри указују на постојање широких луминесцентних трака у видљивој и блиској инфрацрвеној области спектра.

#### ***5. Anomalous sodium doublet D2/D1 spectral line intensity ratio – a manifestation of CCD's presaturation effect***

У раду [5] дати су резултати појаве аномалије дублета Д2/Д1, натријумових линија које су последица нелинеарности детекције ЦЦД камере у случају тачкастих извора светлости. Резултати указују да је добијена нелинеарност у детекцији ЦЦД камере функција времена експозиције. Добијени резултати указују да ако је време експозиције веће то је и аномалија у детекцији већа.

#### ***6. Luminescence during the anodization of zirconium***

У раду [6] дати су резултати испитивања оксидних слојева добијених анодизацијом титанијума у раствору натријум метасиликату у режиму ПЕО и густини струје од 200 mA/cm<sup>2</sup>. Користећи интензитет детектованих Ti линија на 398.18 nm и 501.42 nm израчуната је и електронска температура  $T_e$  у овом процесу и она износи (3700 ± 500) K.

#### ***7. Characterization of the plasma electrolytic oxidation of titanium in sodium metasilicate***

У раду [7] приказани су резултати луминесцентних мерења која се јављају током анодизације цирконијума у растворима оксалне и 12–волфрамсилицијумске киселине. Добијени резултати указују на јак утицај предтретмана површине узорка, као и густине струје на интензитет луминесције.

#### ***8. Luminescence during anodization of magnesium alloy AZ31***

У раду [8] испитивана је луминесценција у току анодизације магнезијумове легуре AZ31 у воденом раствору који садржи 4 g/L Na<sub>2</sub>SiO<sub>3</sub>·5H<sub>2</sub>O + 4 g/L KOH. Галванолуминесцентни спектар има три спектрална максимума на око 430 nm, 600 nm и 780

nm. Детаљно је извршена и карактеризација микро пражњења применом оптичке емисионе спектроскопије и анализом процеса у реалном времену.

### ***9. Luminescence of the B $2\Sigma^+$ -X $2\Sigma^+$ band system of AlO during plasma electrolytic oxidation of aluminum***

У раду [9] је анализирана плазма електролитичка оксидација алуминијума, анализирајући луминесцентни спектар у опсегу од 500 nm до 556 nm, који је приписан  $v' - v'' = -1$  и  $-2$  прелазима  $B^2 \Sigma^+ - X^2 \Sigma^+$  молекула AlO. Температура плазме је процењена на  $8000 \text{ K} \pm 2000 \text{ K}$ . Такође је израчунат састав плазме која садржи алуминијум и кисеоник под претпоставком термодинамичке равнотеже у температурном опсегу до 11000 K.

### ***10. Identification of the C $2\Pi$ -X $2\Sigma^+$ band system of AlO in the ultraviolet galvanoluminescence obtained during aluminum anodization***

У раду [10] су по први пут презентирани резултати галванолуминесцентних мерења у УВ региону приликом анодизације алуминијума одгрејаног на  $525 \text{ }^\circ\text{C}$ . Интензиван максимум на  $31900 \text{ cm}^{-1}$  је приписан прелазима између вибрационих нивоа  $C^2\Pi \rightarrow X^2\Sigma^+$  молекула AlO.

### ***11. Preparation of silicate tungsten bronzes on aluminum by plasma electrolytic oxidation process in 12-tungstosilicic acid***

У раду [11] је испитивана плазма електролитичка оксидација алуминијума у 12–волфрамсилицијумовој киселини. Показано је да су добијене оксидне површине волфрамске бронзе.

### ***12. Matrix of rectangular pores obtained by AFM nanoindentation and electrolytic oxidation of Al***

У раду [12] је показано да се нано поре правоугаоног облика могу добити на алуминијуму електролитичком оксидацијом применом наноиндентације помоћу АФМ микроскопа. Периоди нанопора у опсегу од 50 nm до 370 nm добијени су у три различита електролита: воденим растворима сумпорне, фосфорне и оксалне киселине.

### ***13. Photoluminescent properties of barrier anodic oxide films on***

У раду [13] је испитивана фотолуминесценција баријерних анодних оксидних слојева добијених у органским и неорганским електролитима. Експериментални подаци указују да фотолуминесценција потиче од два врсте луминесцентних центара који су везани са кисеоничним вакансијама у оксидном слоју.

#### ***14. Characterization of the plasma electrolytic oxidation of aluminium in sodium tungstate***

Морфологија, састав и микро тврдоћа оксидних слојева формираних током плазме анодизације алуминијума у натријум волфрамату су испитивани у раду [14]. Оксидне површине су окарактерисане оптичком емисионом спектроскопијом, AFM, SEM–EDS и XRD. Оптички емисиони спектар микропражњења има неколико интензивних максимума изазваних електронским прелазим у Al, W, Na, O, H атомима.

#### ***15. Luminescence properties of oxide films formed by anodization of aluminum in 12-tungstophosphoric acid***

У раду [15] је истраживана луминесценција оксидних слојева добијених анодизацијом алуминијума у 12–волфрамфосфорној киселини. Детаљно су испитане галванолуминесценте и фотолуминесцентне особине, као и луминесцентне особине у току плазма електролитичке оксидације.

#### ***16. Large single crystals of isomorphous hexaaquametal(II) D-camphor10- sulfonates***

У раду [16] дати су резултати карактеризације новосинтетизованих кристала D-камфор-10-сулфоната са Mn, Fe и Co. Добијени кристали су анализирани између осталог и са ИЦ и УВ-ВИС спектроскопијом. На основу добијених спектра може се закључити да њихова спектрална својства дају потенцијалну могућност њихове употребе као оптички материјали.

#### ***17. The effect of annealing on the photoluminescent and optical properties of porous anodic alumina films formed in sulfamic acid***

У раду [17] су презентирани резултати истраживања фотолуминесценције (ФЛ) порозних оксидних слојева добијених анодизацијом алуминијума у сулфаминској киселини. Широке емисионе ФЛ траке са два спектрална максимума у опсегу од 320 nm до 600 nm се могу запазити. Један је на константној таласној дужини од 460 nm, док се други помера од 390 nm до 475 nm, у зависности од екситационе таласне дужине.



Одгревање и хемијски третман формираних оксидних слојева указује на два различита ФЛ центра. Један ФЛ центар се налазу у зидовима пора и формиран је апсорпцијом воде или ОН група. Други ФЛ центар је повезан са оптичким прелазима у кисеоничним вакансијама.

#### ***18. Electronic transitions during plasma electrolytic oxidation of aluminum***

У раду [18] је испитивана луминесценција током плазма електролитичке оксидације алуминијума у борној киселини и амонијум тартарату. На луминесцентим спектрима се могу уочити неколико интензивних емисионих трака које указују да је луминесценција последица електронских прелаза у атомима Al, O, H и Na.

#### ***19. Metrological assurance of biodevices: The new method of calibration of biochemical analyzers***

У раду [19] је приказана метода која омогућава калибрацију проточних спектрофотометара и биохемијских анализатора применом органских боја.

#### ***20. Structural and luminescence characterization of porous anodic oxide films on aluminum formed in sulfamic acid solution***

У раду [20] су примењене АФМ микроскопија и луминесценте методе (галванолуминесценте и фотолуминесценте) за карактеризацију порозних оксидних слојева добијених анодизацијом алуминијума у сулфаминској киселини. Добијени резултати указују да добијени оксидни слојеви не поседују високо уређену структуру која је неопходна за примену ових слојева у нанотехнологијама.

#### ***21. Galvanoluminescence properties of porous oxide films formed by anodization of aluminum in malonic acid***

У раду [21] је испитиван утицај услова анодизације на интензитет галванолуминесценције и облик спектра порозних оксидних слојева добијених у малонској киселини. Показано је да се два широка спектрална максимума могу уочити у спектралном опсегу од 400 nm до 700 nm. Положај и релативан однос максимума зависи од услова анодизације. ЕДС (Energy Disperse Spectroscopy) и АТР-ФТИР (Attenuated Total Reflectance - Fourier Transform Infrared Spectroscopy) спектроскопија указује да су карбоксилни јони луминесцентни центри, као и код других органских електролита.

## ***22. Effect of aluminum annealing on the galvanoluminescence properties of anodic oxide films formed in organic electrolytes***

У раду [22] је испитиван утицај одгревања површине алуминијума на галванолуминесценте особине анодних оксидних слојева добијених у органским електролитима. Спектрална мерења показују на два типа луминесцентних центара, карбоксилни јони уграђени у оксидни слој и молекули  $\text{AlH}$ ,  $\text{AlO}$ ,  $\text{Al}_2$  и  $\text{AlH}_2$ , такође формираних током анодизације.

## ***23. Nature of galvanoluminescence of oxide films formed by aluminum anodization in inorganic electrolytes***

У раду [23] приказани су резултати галванолуминесцентних мерења оксидних слојева добијених анодизацијом алуминијумских узорака претходно одгрејаних на  $550\text{ }^\circ\text{C}$  у неорганским електролитима. Спектрална мерења показују да је галванолуминесценција проузрокована прелазима у молекулима  $\text{AlH}$ ,  $\text{AlO}$ ,  $\text{Al}_2$  и  $\text{AlH}_2$ , вероватно локализованим у порам кристала гама алумине.

## ***24. The galvanoluminescence spectra of barrier oxide films on aluminum formed in organic electrolytes***

У раду [24] су приказани резултати галванолуминесцентних спектралних мерења баријерних оксидних слојева добијених анодизацијом алуминијума у органским електролитима. Детаљно је испитиван утицај параметара анодизације на облик спектра. Добијени резултати указују да су центри луминесценције карбоксилни јони уграђени у оксидни слој у току процеса анодизације.

## ***25. The galvanoluminescence spectra of barrier oxide films on aluminum formed in inorganic electrolytes***

У раду [25] су по први пут презентирани резултати мерења галванолуминесцентних спектра баријерних оксидних слојева добијених анодизацијом алуминијума у неорганским електролитима (борна киселина + боракс и амонијум борат). На галванолуминесцентним спектрима се могу уочити два спектрална максимума. Први је на око  $430\text{ nm}$  док положај другог спектралног максимума зависи од напона анодизације и помера се од  $600\text{ nm}$  (за напоне анодизације до  $600\text{ V}$ ) до  $680\text{ nm}$  за напон од  $275\text{ V}$ . Поређење добијених резултата са галванолуминесцентним спектрима порозних оксидних

слојева добијених у неорганским електролитима указује на исти механизам галванолуминесценције у свим неорганским електролитима.

#### ***26. Light-emitting-diode-based light source for calibration of an intensified charge-coupled device detection system intended for galvanoluminescence measurements***

У раду [26] је приказана реализација стабилног извора светлости који се састоји од три LED диоде са различитим спектралним карактеристикама и две интенграционе сфере које мешају и смањују интензитет светлости. Реализовани систем омогућава калибрацију широкопојасних оптичко детекционих система са ICCD (Intensified Couple Charge Device) детектором, који су намењени за временски разложена галванолуминесцентна мерења. Детаљно је описана процедура калибрације извора светлости као и ICCD детекционог система. По први пут су извршена спектрална галванолуминесцентна мерења током анодизације алуминијума у електролитима који формирају порозне оксидне слојеве.

#### ***27. The influence of aluminum treatment and anodizing conditions on the galvanoluminescence properties of porous oxide films formed in sulfuric acid solution***

У раду [27] је први пут показано да се галванолуминесценција јавља приликом анодизације алуминијума у сумпорној киселини. Показано је да интензитет галванолуминесценције јако зависи од претретмана површине алуминијума и услова анодизације. Површинске нечистоће, као и унутрашње нечистоће главни су извор галванолуминесценције у сумпорној киселини, као и код других неорганских електролита који формирају порозне оксидне слојеве.

#### ***28. Galvanoluminescence of porous oxide films formed by anodization of aluminum in chromic acid solution***

У раду [28] је први пут показано да се галванолуминесценција јавља приликом анодизације алуминијума у хромној киселини. Показано је да су површинске нечистоће, као и унутрашње нечистоће главни извор галванолуминесценције порозних оксидних слојева добијених анодизацијом алуминијума у хромној киселини. Такође је показано да галванолуминесценција порозних оксидних слојева добијених анодизацијом алуминијума у хромној киселини зависи од услова анодизације и да се интензивнија галванолуминесценција добија за ниже температуре и мање концентрације електролита, као и за веће густине струје анодизације. Утврђено је да се на галванолуминесцентим

спектрима могу уочити два спектрална максимума на око 425 nm и 595 nm, чији релативни однос не зависи од напона анодизације у потенциостатском режиму, али зависи од температуре електролита.

### ***29. The influence of anodizing conditions on the galvanoluminescence spectra of porous oxide films on aluminum formed in phosphoric acid solution***

У раду [29] су приказане методе које омогућавају снимање галванолуминесцентних спектра порозних оксидних слојева добијених анодизацијом алуминијума у фосфорној киселини у галваностатском и потенциостатском режиму, у стационарном стању. На галванолуминесцентним спектрима се могу уочити два спектрална максимума на око 425 nm и 595 nm, чији релативни однос не зависи од густине струје анодизације (у галваностатском режиму) и напона анодизације (у потенциостатском режиму), али зависи од температуре и концентрације електролита.

### ***30. Galvanoluminescence of oxide films formed by anodization of aluminum in phosphoric acid***

У раду [30] је показано да су површинске нечистоће, као и унутрашње нечистоће главни извор галванолуминесценције порозних оксидних слојева добијених анодизацијом алуминијума у фосфорној киселини. Такође је показано да галванолуминесценција порозних оксидних слојева добијених анодизацијом алуминијума у фосфорној киселини зависи од услова анодизације и да се интензивнија галванолуминесценција добија за ниже температуре и мање концентрације електролита, као и за веће густине струје анодизације.

### ***31. Galvanoluminescence spectra of porous oxide layers formed by aluminum anodization in oxalic acid***

У раду [31] је показано да галванолуминесцентне спектре порозних оксидних слојева добијених анодизацијом алуминијума у оксалној киселини карактеришу два широка спектрална максимума. Максимуми се налазе у видљивој области на таласним дужинама од 456 nm и 485 nm. Максимуми потичу од два типа луминесцентних центара и то оксалатних јона ( $C_2O_4^{2-}$ ) и карбоксилних јона ( $COO^-$ ), који се у оксидни слој уграђују током процеса анодизације. Добијени резултати су потврдили да облик спектра не зависи од температурског и хемијског предтретмана узорка, већ само од услова анодизације.

## 5. СПИСАК ПУБЛИКАЦИЈА

### A. Радови у међународним часописима

#### Радови у водећим међународним часописима (импакт фактор >1)

##### **1. *LED-based Vis-NIR spectrally tunable light source - the optimization algorithm***

Lukovic Milentije, Lukovic Vanja , Belca Ivan, Kasalica Becko, Stanimirovic Ivan, Vacic Milos

Journal of the European Optical Society-Rapid Publications, (2016),

**DOI:** 10.1186/s41476-016-0021-9 (**IF=1.199**)

##### **2. *The mechanism of evolution of microdischarges at the beginning of the PEO process on aluminum***

Kasalica Becko V Radic-Peric Jelena B Peric Miljenko N Petkovic-Benazzouz Marija M Belca Ivan D Sarvan Mirjana Z

Surface & Coatings Technology, (2016), vol. 298 br. , str. 24-32 (**IF=2.589**)

##### **3. *Investigation of long-duration plasma electrolytic oxidation of aluminum by means of optical spectroscopy***

M. Sarvan, J. Radić-Perić, B. Kasalica, I. Belča, S. Stojadinović, M. Perić,

Surface & Coatings Technology 254 (2014) 270–276. (**IF 2.199**)

##### **4. *Galvanoluminescence of oxide films during the anodization of titanium***

S. Stojadinović, R. Vasilić, M. Petković, I. Belča, B. Kasalica, Lj. Zeković,

Electrochemistry Communications 35 (2013) 22–25. (**IF 4.847**)

**5. Anomalous sodium doublet D2/D1 spectral line intensity ratio – a manifestation of CCD's presaturation effect**

Bečko Kasalica, Stevan Stojadinović, Ivan Belča, Mirjana Sarvan, Ljubiša Zeković, Jelena Radić-Perić

Journal of Analytical Atomic Spectrometry., 2013, Advance Article

DOI: 10.1039/C2JA30239J, Paper (**IF = 3.22**)

**6. Characterization of the plasma electrolytic oxidation of titanium in sodium metasilicate**

S. Stojadinović, R. Vasilić, M. Petković, B. Kasalica, I. Belča, A. Žekić, Lj. Zeković

*Applied Surface Science*, 265 (2013) 226–233. (**IF = 2.1**)

**7. Luminescence during the anodization of zirconium**

Stojadinović, S., Vasilić, R., Petković, M., Belča, I., Kasalica, B., Perić, M., Zeković, L.

*Electrochimica Acta* 79 , (2012 g.) (**IF = 3.82**)

**8. Luminescence during anodization of magnesium alloy AZ31**

Stojadinović, S., Vasilić, R., Petković, M., Belča, I., Kasalica, B., Perić, M., Zeković, L.

*Electrochimica Acta* 59 , (2012 g.) (**IF = 3.82**)

**9. Luminescence of the B 2Σ<sup>+</sup>-X 2Σ<sup>+</sup> band system of AlO during plasma electrolytic oxidation of aluminum**

Stojadinović, S., Perić, M., Petković, M., Vasilić, R., Kasalica, B., Belča, I., Radić-Perić, J.

*Electrochimica Acta* 56, (2011 g.) (**IF = 3.82**)

**10. Identification of the C 2Π-X 2Σ<sup>+</sup> band system of AlO in the ultraviolet galvanoluminescence obtained during aluminum anodization**

Sarvan, M., Perić, M., Zeković, L., Stojadinović, S., Belča, I., Petković, M., Kasalica, B.

Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 81 (2011 g.)

(*IF* =2.1)

***11. Preparation of silicate tungsten bronzes on aluminum by plasma electrolytic oxidation process in 12-tungstosilicic acid***

Petković, M., Stojadinović, S., Vasilić, R., Belča, I., Nedić, Z., Kasalica, B., Mioč, U.B.

Applied Surface Science 257 (2011 g.) (*IF* = 2.1)

***12. Matrix of rectangular pores obtained by AFM nanoindentation and electrolytic oxidation of Al***

Belca, I.D., Petkovic, M., Stojadinovic, S., Kasalica, B., Belca, J.S., Zekovic, Lj.D.

Applied Physics A: Materials Science and Processing 104 (1) , (2011 g.) (*IF* = 1.63)

***13. Photoluminescent properties of barrier anodic oxide films on aluminum***

Stojadinovic, S., Vasilic, R., Nedic, Z., Kasalica, B., Belca, I., Zekovic, L.

Thin Solid Films 519 (2011 g.) (*IF* = 1.89)

***14. Characterization of the plasma electrolytic oxidation of aluminium in sodium tungstate***

Stojadinovic, S., Vasilic, R., Belca, I., Petkovic, M., Kasalica, B., Nedic, Z., Zekovic, L.

Corrosion Science 52 (2010 g.) (*IF* = 3.27)

***15. Luminescence properties of oxide films formed by anodization of aluminum in 12-tungstophosphoric acid***

Stojadinovic, S., Vasilic, R., Petkovic, M., Nedic, Z., Kasalica, B., Belca, I., Zekovic, Lj.

Electrochimica Acta 55 (2010 g.) (*IF* = 3.65)

***16. Large single crystals of isomorphous hexaaquametal(II) D-camphor10- sulfonates***

Jeremić, D.A., Kaluderović, G.N., Gómez-Ruiz, S., Brčeski, I., Kasalica, B., Leovac, V.M.

Crystal Growth and Design 10 (2010 g.) (*IF* = 4.39)

***17. The effect of annealing on the photoluminescent and optical properties of porous anodic alumina films formed in sulfamic acid***

Stojadinovic, S., Nedic, Z., Belca, I., Vasilic, R., Kasalica, B., Petkovic, M., Zekovic, Lj.

Applied Surface Science 256 (2009 g.) (*IF* = 1.62)

***18. Electronic transitions during plasma electrolytic oxidation of aluminum***

Kasalica, B., Petkovic, M., Belca, I., Stojadinovic, S., Zekovic, L.

Surface and Coatings Technology 203 (2009 g.) (*IF* = 1.79)

***19. Metrological assurance of biodevices: The new method of calibration of biochemical analyzers***

Skerovic, V., Zarubica, V., Kasalica, B., Stojadinovic, S., Belca, I.

Analytical Letters 42 (2009 g.) (*IF* = 1.32)

***20. Structural and luminescence characterization of porous anodic oxide films on aluminum formed in sulfamic acid solution***

Stojadinovic, S., Vasilic, R., Belca, I., Tadic, M., Kasalica, B., Zekovic, Lj.

Applied Surface Science 255 (2008 g.) (*IF* = 3.08)

***21. Galvanoluminescence properties of porous oxide films formed by anodization of aluminum in malonic acid***

Stojadinovic, S., Belca, I., Tadic, M., Kasalica, B., Nedic, Z., Zekovic, Lj.

Journal of Electroanalytical Chemistry 619 (2008 g.) (*IF* = 2.48)

***22. Effect of aluminum annealing on the galvanoluminescence properties of anodic oxide films formed in organic electrolytes***



Sarvan, M., Stojadinovic, S., Kasalica, B., Belca, I., Zekovic, Lj.

Electrochimica Acta 53 (2008 g.) (**IF = 3.08**)

***23. Nature of galvanoluminescence of oxide films formed by aluminum anodization in inorganic electrolytes***

Kasalica, B., Belča, I., Stojadinović, S., Sarvan, M., Perić, M., Zeković, L.

Journal of Physical Chemistry C 111 (2007 g.) (**IF = 3.4**)

***24. The galvanoluminescence spectra of barrier oxide films on aluminum formed in organic electrolytes***

Stojadinovic, S., Tadic, M., Belca, I., Kasalica, B., Zekovic, Lj.

Electrochimica Acta 52 (2007 g.) (**IF = 2.85**)

***25. The galvanoluminescence spectra of barrier oxide films on aluminum formed in inorganic electrolytes***

Stojadinovic, S., Belca, I., Kasalica, B., Zekovic, Lj., Tadic, M.

Electrochemistry Communications 8 (2006 g.) (**IF = 3.48**)

***26. Light-emitting-diode-based light source for calibration of an intensified charge-coupled device detection system intended for galvanoluminescence measurements***

Kasalica, B.V., Belca, I.D., Stojadinovic, S.D.J., Zekovic, L.J.D., Nikolic, D.

Applied Spectroscopy 60 (2006 g.) (**IF = 1.88**)

***27. The influence of aluminum treatment and anodizing conditions on the galvanoluminescence properties of porous oxide films formed in sulfuric acid solution***

Kasalica, B., Stojadinovic, S., Zekovic, Lj., Belca, I., Nikolic, D.

Electrochemistry Communications 7 (2005 g.) (**IF = 3.39**)

**28. Galvanoluminescence of porous oxide films formed by anodization of aluminum in chromic acid solution**

Stojadinovic, S., Belca, I., Zekovic, Lj., Kasalica, B., Nikolic, D.

Electrochemistry Communications 6 (2004 g.) (*IF* = 2.93)

**29. The influence of anodizing conditions on the galvanoluminescence spectra of porous oxide films on aluminum formed in phosphoric acid solution**

Stojadinovic, S., Zekovic, Lj., Belca, I., Kasalica, B., Nikolic, D.

Electrochemistry Communications 6 (2004 g.) (*IF* = 2.93)

**30. Galvanoluminescence of oxide films formed by anodization of aluminum in phosphoric acid**

Stojadinovic, S., Zekovic, Lj., Belca, I., Kasalica, B.

Electrochemistry Communications 6 (2004 g.) (*IF* = 2.93)

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By: Witt, K.; Wolf, H. U.; Heuck, C.; et al.

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1. Investigation of roughness and specular quality of commercial aluminum (6061 alloy) for fabrication of nanoporous anodic alumina films

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By: Kikuchi, Tatsuya; Nishinaga, Osamu; Natsui, Shungo; et al.

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6. Characterization of Porous Anodic Aluminum Oxide Films by Luminescence Methods - A Review

By: Stojadinovic, Stevan; Vasilic, Rastko

CURRENT NANOSCIENCE Volume: 11 Issue: 5 Pages: 547-559 Published: 2015

7. Porous Aluminum Oxide Formed by Anodizing in Various Electrolyte Species

By: Kikuchi, Tatsuya; Nakajima, Daiki; Nishinaga, Osamu; et al.

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8. A Review of Quantitative Arrangement Analysis Methods Applied to Nanostructured Anodic Oxides Characterization

By: Nowak-Stepniowska, Agata

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- 10.** Plasma electrolytic oxidation coatings in KOH electrolyte and its discharge characteristics  
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- 14.** Evolution of active species and discharge sparks in Na<sub>2</sub>SiO<sub>3</sub> electrolyte during PEO process  
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- 15.** Optical emission spectroscopy studies of discharge mechanism and plasma characteristics during plasma electrolytic oxidation of magnesium in different electrolytes  
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**21. *Galvanoluminescence properties of porous oxide films formed by anodization of aluminum in malonic acid***

- 1.** Scratch behavior of aluminum anodized in oxalic acid: Effect of anodizing potential  
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 By: Nowak-Stepniowska, Agata  
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By: Stojadinovic, S.; Vasilic, R.; Petkovic, M.; et al.

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By: Petkovic, M.; Stojadinovic, S.; Vasilic, R.; et al.

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By: Stojadinovic, S.; Jovovic, J.; Petkovic, M.; et al.

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**19.** Evolution of active species and discharge sparks in Na<sub>2</sub>SiO<sub>3</sub> electrolyte during PEO process

By: Wang, Li; Fu, Wen; Chen, Li

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**20.** Optical emission spectroscopy studies of discharge mechanism and plasma characteristics during plasma electrolytic oxidation of magnesium in different electrolytes

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**22.** *Effect of aluminum annealing on the galvanoluminescence properties of anodic oxide films formed in organic electrolytes*

1. A Review of Quantitative Arrangement Analysis Methods Applied to Nanostructured Anodic Oxides Characterization

By: Nowak-Stepniowska, Agata

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1. Light emission from electrodes under dielectrophoresis conditions

By: Tsai, Long-Fang; Gong, Hua; Dallon, Kathryn L.; et al.

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3. Porous Anodic Aluminum Oxide: Anodization and Templated Synthesis of Functional Nanostructures

By: Lee, Woo; Park, Sang-Joon

CHEMICAL REVIEWS Volume: 114 Issue: 15 Pages: 7487-7556 Published: AUG 13 2014

4. Investigation of plasma electrolytic oxidation on valve metals by means of molecular spectroscopy - a review

By: Stojadinovic, Stevan; Vasilic, Rastko; Peric, Miljenko

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By: Hickmott, T. W.

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**24. *The galvanoluminescence spectra of barrier oxide films on aluminum formed in organic electrolytes***

1. Characterization of Porous Anodic Aluminum Oxide Films by Luminescence Methods - A Review

By: Stojadinovic, Stevan; Vasilic, Rastko

CURRENT NANOSCIENCE Volume: 11 Issue: 5 Pages: 547-559 Published: 2015

2. Plasma electrolytic oxidation of an Al-Cu-Li alloy in alkaline aluminate electrolytes: A competition between growth and dissolution for the initial ultra-thin films

By: Cheng, Ying-liang; Mao, Mo-ke; Cao, Jin-hui; et al.

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3. Investigations on current transients in porous alumina films during re-anodizing using the electrochemical quartz crystal microbalance

By: Ispas, Adriana; Bund, Andreas; Vrublevsky, Igor

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1. Effects of 2-methyl-1, 3-propanediol in boric acid solution on the anodizing behavior and electrical properties of ZrO<sub>2</sub>-coated Al foil

By: Zhang, Kaiqiang; Park, Sang-Shik

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1. Real-time imaging, spectroscopy, and structural investigation of cathodic plasma electrolytic oxidation of molybdenum  
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4. Characterization of Bronze Surface Layer Formed by Microarc Oxidation Process in 12-Tungstophosphoric Acid

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**27. *The influence of aluminum treatment and anodizing conditions on the galvanoluminescence properties of porous oxide films formed in sulfuric acid solution***

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CHEMICAL REVIEWS Volume: 114 Issue: 15 Pages: 7487-7556 Published: AUG 13 2014

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By: Ispas, Adriana; Bund, Andreas; Vrublevsky, Igor

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1. Characterization of Porous Anodic Aluminum Oxide Films by Luminescence Methods - A Review

By: Stojadinovic, Stevan; Vasilic, Rastko

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CHEMICAL REVIEWS Volume: 114 Issue: 15 Pages: 7487-7556 Published: AUG 13 2014

5. Potentiodynamic behavior of as-grown and annealed porous anodic alumina films: Current overshoots and oscillations in transients

By: Vrublevsky, I.; Jagminas, A.; Schreckenbach, J.; et al.

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***29. The influence of anodizing conditions on the galvanoluminescence spectra of porous oxide films on aluminum formed in phosphoric acid solution***

1. Porous Aluminum Oxide Formed by Anodizing in Various Electrolyte Species

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***30. Galvanoluminescence of oxide films formed by anodization of aluminum in phosphoric acid***

1. Light emission from electrodes under dielectrophoresis conditions

By: Tsai, Long-Fang; Gong, Hua; Dallon, Kathryn L.; et al.

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## ЗАКЉУЧАК

На конкурс за редовног професора са пуним радним временом за ужу научну област Примењена физика расписаном 19.07.2017. године у листу „Послови” по одлуци IX седнице Изборног наставно-научног већа Физичког факултета Универзитета у Београду од 28.07.2017. године, јавио се један кандидат, др Бећко Касалица. Кандидат на основу предходно изложених података из биографије и наставно-научног рада, испуњава услове за избор у звање редовног професора, предвиђене Законом о високом образовању Републике Србије, Правилником о условима за стицање звања наставника на Универзитету у Београду и Статутом Физичког факултета.

Научни рад кандидата је резултирао са 31-ним радом у водећим међународним часописима (са импакт фактором  $> 1$ )<sup>1</sup>. Укупан импакт фактор тих радова износи 79.084, а средњим импакт фактором од 2.55. Поменти радови су цитирани преко 283 пута без самоцитата и цитата коаутора, а са цитатима коаутора преко 392 пута<sup>2</sup>. Након избора у звање ванредног професора кандидат је објавио 5 радова у водећим међународним часописима (са импакт фактором  $> 1$ ). Кандидат је коаутор једног уџбеника и једног поглавља у водећој међународној монографији. Учесник је домаћих и међународних конференција са усменим и постер презентацијама, као и предавања по позиву.

Наставна активност кандидата показује способност да развија и унапређује студијске курсеве. Резултат ове активности је увођење нових вежби и нових предмета. Педагошки рад кандидата је одлично оцењен од стране студената 4.76 (средња оцена у предходне три године).

На основу изложеног, Комисија

**ПРЕДЛАЖЕ**

**Изборном већу Физичког факултета да др Бећка Касалицу изабере у звање и на радно место РЕДОВНОГ ПРОФЕСОРА за ужу научну област Примењена физика на Физичком факултету Универзитета у Београду.**

Комисија

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Академик Миљенко Перић  
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Београд, 11.09.2017.