

## Bibliography

- Abbas, N., Malik, M., Alqarni, M., & Nadeem, S. 2020. Study of three dimensional stagnation point flow of hybrid nanofluid over an isotropic slip surface. *Physica A: Statistical Mechanics and its Applications*, 554, 124020.
- Abbas, T., Hayat, T., Ayub, M., Bhatti, M. M., & Alsaedi, A. 2019. Electromagnetohydrodynamic nanofluid flow past a porous rigid plate containing gyrotactic microorganism. *Neural Computing and Applications*, 31(6), 1905–1913.
- Abbas, Z., Naveed, M., Tabassum, R., & Ahmad, I. 2021. Influence of hall and joule heating on a magnetic nanofluid ( $Fe_3O_4$ ) flow on a rotating disk with generalized slip condition. *Heat Transfer*, 50(7), 7271–7290.
- Abbasi, F., Hayat, T., & Ahmad, B. 2015. Peristalsis of silver-water nanofluid in the presence of hall and ohmic heating effects: applications in drug delivery. *Journal of Molecular Liquids*, 207, 248–255.
- Abdelmalek, Z., Mahanthesh, B., Basir, M. F. M., Imtiaz, M., Mackolil, J., Khan, N. S., . . . Tlili, I. 2020. Mixed radiated magneto casson fluid flow with arrhenius activation energy and newtonian heating effects: Flow and sensitivity analysis. *Alexandria Engineering Journal*, 59(5), 3991–4011.
- Abdul Halim, N., & Mohd Noor, N. F. 2021. Mixed convection flow of powell–eyring nanofluid near a stagnation point along a vertical stretching sheet. *Mathematics*, 9(4), 364.
- Abo-Dahab, S., Abdelhafez, M., Mebarek-Oudina, F., & Bilal, S. 2021. Mhd casson nanofluid flow over nonlinearly heated porous medium in presence of extending surface effect with suction/injection. *Indian Journal of Physics*, 95(12), 2703–2717.
- Agrawal, P., Dadhech, P. K., Jat, R., Baleanu, D., & Purohit, S. D. 2021. Radiative mhd hybrid-nanofluids flow over a permeable stretching surface with heat source/sink embedded in porous medium. *International Journal of Numerical Methods for Heat & Fluid Flow*, 31(8), 2818–2840.
- Ahmad, S., Ashraf, M., & Ali, K. 2020. Bioconvection due to gyrotactic microbes in a nanofluid flow through a porous medium. *Heliyon*, 6(12), e05832.
- Ahmad, S., Ijaz Khan, M., Hayat, T., & Alsaedi, A. 2020. Numerical analysis of

## ***Bibliography***

---

- copper-water and copper-oxide-water nanofluids flow over a stretching sheet. *International Journal of Modern Physics B*, 34(13), 2050130.
- Ahmad, S., Nadeem, S., Muhammad, N., & Issakhov, A. 2020. Radiative swent and mwent nanofluid flow of falkner–skan problem with double stratification. *Physica A: Statistical Mechanics and its Applications*, 547, 124054.
- Akbar, A. A., Ahammad, N. A., Awan, A. U., Hussein, A. K., Gamaoun, F., Tag-ElDin, E. M., & Ali, B. 2022. Insight into the role of nanoparticles shape factors and diameter on the dynamics of rotating water-based fluid. *Nanomaterials*, 12(16), 2801.
- Al-Amri, F., & Muthtamilselvan, M. 2020. Stagnation point flow of nanofluid containing micro-organisms. *Case Studies in Thermal Engineering*, 21, 100656.
- Alben, K. T. 2002. *Books and software: design, analyze, and optimize with design-expert*. ACS Publications.
- Alfvén, H. 1942. Existence of electromagnetic-hydrodynamic waves. *Nature*, 150(3805), 405–406.
- Alghamdi, M., Wakif, A., Thumma, T., Khan, U., Baleanu, D., & Rasool, G. 2021. Significance of variability in magnetic field strength and heat source on the radiative-convective motion of sodium alginate-based nanofluid within a darcy-brinkman porous structure bounded vertically by an irregular slender surface. *Case Studies in Thermal Engineering*, 28, 101428.
- Ali, B., Hussain, S., Abdal, S., & Mehdi, M. M. 2020. Impact of stefan blowing on thermal radiation and cattaneo–christov characteristics for nanofluid flow containing microorganisms with ablation/accretion of leading edge: Fem approach. *The European Physical Journal Plus*, 135(10), 1–18.
- Ali, F. M., Nazar, R., Arifin, N. M., & Pop, I. 2011a. Mhd boundary layer flow and heat transfer over a stretching sheet with induced magnetic field. *Heat and Mass transfer*, 47(2), 155–162.
- Ali, F. M., Nazar, R., Arifin, N. M., & Pop, I. 2011b. Mhd stagnation-point flow and heat transfer towards stretching sheet with induced magnetic field. *Applied Mathematics and Mechanics*, 32(4), 409–418.
- Ali, R., Asjad, M. I., & Akgül, A. 2021. An analysis of a mathematical fractional model of hybrid viscous nanofluids and its application in heat and mass transfer. *Journal of Computational and Applied Mathematics*, 383, 113096.

- Alqarni, M., Waqas, H., Alghamdi, M., & Muhammad, T. 2022. Importance of bioconvection in 3d viscoelastic nanofluid flow due to exponentially stretching surface with nonlinear radiative heat transfer and variable thermal conductivity. *Journal of Thermal Analysis and Calorimetry*, 147(7), 4805–4819.
- Al-Rashed, A. A., Shahsavar, A., Rasooli, O., Moghimi, M., Karimipour, A., & Tran, M. D. 2019. Numerical assessment into the hydrothermal and entropy generation characteristics of biological water-silver nano-fluid in a wavy walled microchannel heat sink. *International Communications in Heat and Mass Transfer*, 104, 118–126.
- Alsaedi, A., Khan, M. I., Farooq, M., Gull, N., & Hayat, T. 2017. Magnetohydrodynamic (mhd) stratified bioconvective flow of nanofluid due to gyrotactic microorganisms. *Advanced Powder Technology*, 28(1), 288–298.
- Alshomrani, A. S., Ullah, M. Z., & Baleanu, D. 2020. Importance of multiple slips on bioconvection flow of cross nanofluid past a wedge with gyrotactic motile microorganisms. *Case Studies in Thermal Engineering*, 22, 100798.
- Aly, E. H., & Pop, I. 2020. Mhd flow and heat transfer near stagnation point over a stretching/shrinking surface with partial slip and viscous dissipation: Hybrid nanofluid versus nanofluid. *Powder Technology*, 367, 192–205.
- Amanulla, C., Saleem, S., Wakif, A., & AlQarni, M. 2019. Mhd prandtl fluid flow past an isothermal permeable sphere with slip effects. *Case Studies in Thermal Engineering*, 14, 100447.
- Amjad, M., Zehra, I., Nadeem, S., Abbas, N., Saleem, A., & Issakhov, A. 2020. Influence of lorentz force and induced magnetic field effects on casson micropolar nanofluid flow over a permeable curved stretching/shrinking surface under the stagnation region. *Surfaces and Interfaces*, 21, 100766.
- Ankamwar, B. 2012. Size and shape effect on biomedical applications of nanomaterials. *Biomedical Engineering-Technical Applications in Medicine*(1).
- Ashraf, M. U., Qasim, M., Wakif, A., Afridi, M. I., & Animasaun, I. L. 2022. A generalized differential quadrature algorithm for simulating magnetohydrodynamic peristaltic flow of blood-based nanofluid containing magnetite nanoparticles: a physiological application. *Numerical Methods for Partial Differential Equations*, 38(3), 666–692.
- Azizian, R., Doroodchi, E., McKrell, T., Buongiorno, J., Hu, L., & Moghtaderi, B.

## ***Bibliography***

---

2014. Effect of magnetic field on laminar convective heat transfer of magnetite nanofluids. *International Journal of Heat and Mass Transfer*, 68, 94–109.
- Bachok, N., Ishak, A., & Pop, I. 2011. Flow and heat transfer over a rotating porous disk in a nanofluid. *Physica B: Condensed Matter*, 406(9), 1767–1772.
- Bai, R. G., Muthoosamy, K., & Manickam, S. 2015. Nanomedicine in theranostics. In *Nanotechnology applications for tissue engineering* (pp. 195–213). Elsevier.
- Bansal, J. 1977. *Viscous fluid dynamics*. Oxford & IBH Publishing Company.
- Barik, A. K., Mishra, S. K., Mishra, S., & Pattnaik, P. 2020. Multiple slip effects on mhd nanofluid flow over an inclined, radiative, and chemically reacting stretching sheet by means of fdm. *Heat Transfer—Asian Research*, 49(1), 477–501.
- Basir, M. F. M., Bilal, M., Choudhary, R., Mackolil, J., Mahanthesh, B., & Nisar, K. S. 2021. Numerical and sensitivity analysis of mhd bioconvective slip flow of nanomaterial with binary chemical reaction and newtonian heating. *Heat Transfer*, 50(6), 5439–5466.
- Bég, O. A., Kabir, M. N., Uddin, M. J., Izani Md Ismail, A., & Alginahi, Y. M. 2021. Numerical investigation of von karman swirling bioconvective nanofluid transport from a rotating disk in a porous medium with stefan blowing and anisotropic slip effects. *Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science*, 235(19), 3933–3951.
- Behnam, M. A., Emami, F., Sobhani, Z., & Dehghanian, A. R. 2018. The application of titanium dioxide (tio<sub>2</sub>) nanoparticles in the photo-thermal therapy of melanoma cancer model. *Iranian Journal of Basic Medical Sciences*, 21(11), 1133.
- Benkhedda, M., Boufendi, T., Tayebi, T., & Chamkha, A. J. 2020. Convective heat transfer performance of hybrid nanofluid in a horizontal pipe considering nanoparticles shapes effect. *Journal of Thermal Analysis and Calorimetry*, 140(1), 411–425.
- Besthapu, P., Haq, R. U., Bandari, S., & Al-Mdallal, Q. M. 2019. Thermal radiation and slip effects on mhd stagnation point flow of non-newtonian nanofluid over a convective stretching surface. *Neural Computing and Applications*, 31(1), 207–217.
- Bhanvase, B. A., & Barai, D. 2021. *Nanofluids for heat and mass transfer:*

- Fundamentals, sustainable manufacturing and applications*. Academic Press.
- Bhatti, M., & Michaelides, E. E. 2021. Study of arrhenius activation energy on the thermo-bioconvection nanofluid flow over a riga plate. *Journal of Thermal Analysis and Calorimetry*, 143(3), 2029–2038.
- Bhatti, M. M., Shahid, A., Abbas, T., Alamri, S. Z., & Ellahi, R. 2020. Study of activation energy on the movement of gyrotactic microorganism in a magnetized nanofluids past a porous plate. *Processes*, 8(3), 328.
- Bilal, M., Sagheer, M., & Hussain, S. 2018. Numerical study of magnetohydrodynamics and thermal radiation on williamson nanofluid flow over a stretching cylinder with variable thermal conductivity. *Alexandria Engineering Journal*, 57(4), 3281–3289.
- Blasiak, B., van Veggel, F. C., & Tomanek, B. 2013. Applications of nanoparticles for mri cancer diagnosis and therapy. *Journal of Nanomaterials*, 2013, 1–12.
- Box, G. E., & Wilson, K. B. 1992. On the experimental attainment of optimum conditions. In *Breakthroughs in statistics* (pp. 270–310). Springer.
- Brinkman, H. C. 1952. The viscosity of concentrated suspensions and solutions. *The Journal of Chemical Physics*, 20(4), 571.
- Bulirsch, R., Stoer, J., & Stoer, J. 2002. *Introduction to numerical analysis* (Vol. 3). Springer.
- Buongiorno, J. 2006. Convective transport in nanofluids. *Journal of Heat Transfer*, 128(3), 240–250.
- Casson, N. 1959. A flow equation for pigment-oil suspensions of the printing ink type. *Rheology of Disperse Systems*, 84–104.
- Cengel, Y., & Cimbala, J. 2013. *Fluid mechanics fundamentals and applications*. McGraw Hill.
- Choi, S. U. S., & Eastman, J. A. 1995. Enhancing thermal conductivity of fluids with nanoparticles. *Proceedings of the 1995 International Mechanical Engineering Congress and Exposition, ASME, San Francisco*, 66, 99-105.
- Chu, Y.-M., Khan, M. I., Khan, N. B., Kadry, S., Khan, S. U., Tlili, I., & Nayak, M. 2020. Significance of activation energy, bio-convection and magnetohydrodynamic in flow of third grade fluid (non-newtonian) towards stretched surface: A buongiorno model analysis. *International Communications in Heat and Mass Transfer*, 118, 104893.

## ***Bibliography***

---

- Chugh, H., Sood, D., Chandra, I., Tomar, V., Dhawan, G., & Chandra, R. 2018. Role of gold and silver nanoparticles in cancer nano-medicine. *Artificial Cells, Nanomedicine, and Biotechnology*, 46(sup1), 1210–1220.
- Comparetti, E. J., Pedrosa, V. d. A., & Kaneno, R. 2017. Carbon nanotube as a tool for fighting cancer. *Bioconjugate Chemistry*, 29(3), 709–718.
- Cortell, R. 2007. Viscous flow and heat transfer over a nonlinearly stretching sheet. *Applied Mathematics and Computation*, 184(2), 864–873.
- Daniel, Y. S., Aziz, Z. A., Ismail, Z., & Bahar, A. 2020. Unsteady emhd dual stratified flow of nanofluid with slips impacts. *Alexandria Engineering Journal*, 59(1), 177–189.
- Daniel, Y. S., Aziz, Z. A., Ismail, Z., & Salah, F. 2017a. Double stratification effects on unsteady electrical mhd mixed convection flow of nanofluid with viscous dissipation and joule heating. *Journal of Applied Research and Technology*, 15(5), 464–476.
- Daniel, Y. S., Aziz, Z. A., Ismail, Z., & Salah, F. 2017b. Effects of thermal radiation, viscous and joule heating on electrical mhd nanofluid with double stratification. *Chinese Journal of Physics*, 55(3), 630–651.
- Daniel, Y. S., Aziz, Z. A., Ismail, Z., & Salah, F. 2018. Effects of slip and convective conditions on mhd flow of nanofluid over a porous nonlinear stretching/shrinking sheet. *Australian Journal of Mechanical Engineering*, 16(3), 213–229.
- Daniel, Y. S., Aziz, Z. A., Ismail, Z., & Salah, F. 2019. Thermal radiation on unsteady electrical mhd flow of nanofluid over stretching sheet with chemical reaction. *Journal of King Saud University-Science*, 31(4), 804–812.
- Dinarvand, S., Rostami, M. N., Dinarvand, R., & Pop, I. 2019. Improvement of drug delivery micro-circulatory system with a novel pattern of cu-cu/blood hybrid nanofluid flow towards a porous stretching sheet. *International Journal of Numerical Methods for Heat & Fluid Flow*, 29(11), 4408–4429.
- Doh, D.-H., Muthamilselvan, M., Swathene, B., & Ramya, E. 2020. Homogeneous and heterogeneous reactions in a nanofluid flow due to a rotating disk of variable thickness using ham. *Mathematics and Computers in Simulation*, 168, 90–110.
- Duangthongsuk, W., & Wongwises, S. 2009. Measurement of temperature-dependent

- thermal conductivity and viscosity of tio<sub>2</sub>-water nanofluids. *Experimental Thermal and Fluid Science*, 33(4), 706–714.
- Eid, M. R. 2020. Effects of np shapes on non-newtonian bio-nanofluid flow in suction/blowing process with convective condition: Sisko model. *Journal of Non-Equilibrium Thermodynamics*, 45(2), 97–108.
- Eid, M. R., Al-Hossainy, A., & Zoromba, M. S. 2019. Fem for blood-based swcnts flow through a circular cylinder in a porous medium with electromagnetic radiation. *Communications in Theoretical Physics*, 71(12), 1425.
- Eid, M. R., Mahny, K., Dar, A., & Muhammad, T. 2020. Numerical study for carreau nanofluid flow over a convectively heated nonlinear stretching surface with chemically reactive species. *Physica A: Statistical Mechanics and its Applications*, 540, 123063.
- Einstein, A. 1906. Eine neue bestimmung der moleküldimensionen. *Annalen der Physik*, 324(2), 289–306.
- El-Aziz, M. A., & Afify, A. A. 2018. Influences of slip velocity and induced magnetic field on mhd stagnation-point flow and heat transfer of casson fluid over a stretching sheet. *Mathematical Problems in Engineering*, 2018, 9402836.
- Ellahi, R., Hassan, M., & Zeeshan, A. 2017. Shape effects of spherical and nonspherical nanoparticles in mixed convection flow over a vertical stretching permeable sheet. *Mechanics of Advanced Materials and Structures*, 24(15), 1231–1238.
- Elnaqeeb, T., Animasaun, I. L., & Shah, N. A. 2021. Ternary-hybrid nanofluids: significance of suction and dual-stretching on three-dimensional flow of water conveying nanoparticles with various shapes and densities. *Zeitschrift für Naturforschung A*, 76(3), 231–243.
- Fang, T., & Aziz, A. 2010. Viscous flow with second-order slip velocity over a stretching sheet. *Zeitschrift für Naturforschung A*, 65(12), 1087–1092.
- Fang, T., & Jing, W. 2014. Flow, heat, and species transfer over a stretching plate considering coupled stefan blowing effects from species transfer. *Communications in Nonlinear Science and Numerical Simulation*, 19(9), 3086–3097.
- Farooq, U., Waqas, H., Khan, M. I., Khan, S. U., Chu, Y.-M., & Kadry, S. 2021. Thermally radioactive bioconvection flow of carreau nanofluid with

## ***Bibliography***

---

- modified cattaneo-christov expressions and exponential space-based heat source. *Alexandria Engineering Journal*, 60(3), 3073–3086.
- Farrokhi, H., Otuya, D. O., Khimchenko, A., & Dong, J. 2019. Magnetohydrodynamics in biomedical applications. *Nanofluid Flow in Porous Media*.
- Fisher, R. 1950. *On the 'probable error' of a coefficient of correlation deduced from a small sample, metron i (1921). reprinted in: Contributions to mathematical statistics. 3–32.* Wiley, New York.
- Foulkes, R., Ali Asgari, M., Curtis, A., & Hoskins, C. 2019. Silver-nanoparticle-mediated therapies in the treatment of pancreatic cancer. *ACS Applied Nano Materials*, 2(4), 1758–1772.
- Gangadhar, K., Ramana, K., Makinde, O. D., & Kumar, B. R. 2018. Mhd flow of a carreau fluid past a stretching cylinder with cattaneo-christov heat flux using spectral relaxation method. *Defect and Diffusion Forum*, 387, 91–105.
- Gelci, K., & Mehrmohammadi, M. 2014. Photothermal therapy. *Encyclopedia of Cancer; Schwab, M., Ed.; Springer: Berlin/Heidelberg, Germany*, 1–5.
- Gholinia, M., Hoseini, M., & Gholinia, S. 2019. A numerical investigation of free convection mhd flow of walters-b nanofluid over an inclined stretching sheet under the impact of joule heating. *Thermal Science and Engineering Progress*, 11, 272–282.
- Gireesha, B., Mahanthesh, B., Shivakumara, I., & Eshwarappa, K. 2016. Melting heat transfer in boundary layer stagnation-point flow of nanofluid toward a stretching sheet with induced magnetic field. *Engineering Science and Technology, an International Journal*, 19(1), 313–321.
- Gireesha, B., Umeshaiyah, M., Prasannakumara, B., Shashikumar, N., & Archana, M. 2020. Impact of nonlinear thermal radiation on magnetohydrodynamic three dimensional boundary layer flow of jeffrey nanofluid over a nonlinearly permeable stretching sheet. *Physica A: Statistical Mechanics and its Applications*, 549, 124051.
- Gowda, R. P., Kumar, R. N., Prasannakumara, B., Nagaraja, B., & Gireesha, B. 2021. Exploring magnetic dipole contribution on ferromagnetic nanofluid flow over a stretching sheet: An application of stefan blowing. *Journal of Molecular Liquids*, 335, 116215.



- Graham, A. L. 1981. On the viscosity of suspensions of solid spheres. *Applied Scientific Research*, 37(3), 275–286.
- Gunawan, E. R., & Suhendra, D. 2008. Four-factor response surface optimization of the enzymatic synthesis of wax ester from palm kernel oil. *Indonesian Journal of Chemistry*, 8(1), 83–90.
- Hady, F. M., Ibrahim, F. S., Abdel-Gaied, S. M., & Eid, M. R. 2012. Radiation effect on viscous flow of a nanofluid and heat transfer over a nonlinearly stretching sheet. *Nanoscale Research Letters*, 7(1), 1–13.
- Hafeez, A., Khan, M., & Ahmed, J. 2020. Stagnation point flow of radiative oldroyd-b nanofluid over a rotating disk. *Computer Methods and Programs in Biomedicine*, 191, 105342.
- Halim, N., Sivasankaran, S., & Noor, N. M. 2017. Active and passive controls of the williamson stagnation nanofluid flow over a stretching/shrinking surface. *Neural Computing and Applications*, 28(1), 1023–1033.
- Hamilton, R. L., & Crosser, O. 1962. Thermal conductivity of heterogeneous two-component systems. *Industrial & Engineering Chemistry Fundamentals*, 1(3), 187–191.
- Hayat, T., Aziz, A., Muhammad, T., & Ahmad, B. 2016. On magnetohydrodynamic flow of second grade nanofluid over a nonlinear stretching sheet. *Journal of Magnetism and Magnetic Materials*, 408, 99–106.
- Hayat, T., Farooq, M., & Alsaedi, A. 2015. Homogeneous-heterogeneous reactions in the stagnation point flow of carbon nanotubes with newtonian heating. *AIP Advances*, 5(2), 027130.
- Hayat, T., Haider, F., Muhammad, T., & Alsaedi, A. 2017. On darcy-forchheimer flow of carbon nanotubes due to a rotating disk. *International Journal of Heat and Mass Transfer*, 112, 248–254.
- Hayat, T., Haider, F., Muhammad, T., & Alsaedi, A. 2020. Darcy-forchheimer flow by rotating disk with partial slip. *Applied Mathematics and Mechanics*, 41(5), 741–752.
- Hayat, T., Khan, M. I., Qayyum, S., & Alsaedi, A. 2018. Entropy generation in flow with silver and copper nanoparticles. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, 539, 335–346.
- Hayat, T., Muhammad, K., Farooq, M., & Alsaedi, A. 2016. Melting heat transfer in

## ***Bibliography***

---

- stagnation point flow of carbon nanotubes towards variable thickness surface. *AIP Advances*, 6(1), 015214.
- Hayat, T., Qayyum, S., Imtiaz, M., & Alsaedi, A. 2016. Comparative study of silver and copper water nanofluids with mixed convection and nonlinear thermal radiation. *International Journal of Heat and Mass Transfer*, 102, 723–732.
- Hazarika, S., Ahmed, S., & Chamkha, A. J. 2021. Investigation of nanoparticles cu, ag and fe<sub>3</sub>o<sub>4</sub> on thermophoresis and viscous dissipation of mhd nanofluid over a stretching sheet in a porous regime: a numerical modeling. *Mathematics and Computers in Simulation*, 182, 819–837.
- Hepokur, C., Kariper, İ. A., Mısır, S., Ay, E., Tunoğlu, S., Ersez, M. S., ... Yaylım, İ. 2019. Silver nanoparticle/capecitabine for breast cancer cell treatment. *Toxicology in Vitro*, 61, 104600.
- Hiemenz, K. 1911. Die grenschicht an einem in den gleichförmigen flüssigkeitsstrom eingetauchten geraden kreiszylinder. *Dinglers Polytech. J.*, 326, 321–324.
- Hussain, M., Farooq, U., & Sheremet, M. 2022. Nonsimilar convective thermal transport analysis of emhd stagnation casson nanofluid flow subjected to particle shape factor and thermal radiations. *International Communications in Heat and Mass Transfer*, 137, 106230.
- Hussanan, A., Salleh, M. Z., Alkasasbeh, H. T., & Khan, I. 2018. Mhd flow and heat transfer in a casson fluid over a nonlinearly stretching sheet with newtonian heating. *Heat Transfer Research*, 49(1185–1198).
- Ibrahim, S., Lorenzini, G., Kumar, P. V., & Raju, C. 2017. Influence of chemical reaction and heat source on dissipative mhd mixed convection flow of a casson nanofluid over a nonlinear permeable stretching sheet. *International Journal of Heat and Mass Transfer*, 111, 346–355.
- Ibrahim, W., & Negera, M. 2020. Mhd slip flow of upper-convected maxwell nanofluid over a stretching sheet with chemical reaction. *Journal of the Egyptian Mathematical Society*, 28(1), 1–28.
- Iqbal, M. S., Malik, F., Mustafa, I., Khan, I., Ghaffari, A., Riaz, A., & Nisar, K. S. 2020. Impact of induced magnetic field on thermal enhancement in gravity driven fe<sub>3</sub>o<sub>4</sub> ferrofluid flow through vertical non-isothermal surface. *Results in Physics*, 19, 103472.
- Iqbal, Z., Azhar, E., & Maraj, E. 2017. Transport phenomena of carbon nanotubes

- and bioconvection nanoparticles on stagnation point flow in presence of induced magnetic field. *Physica E: Low-Dimensional Systems and Nanostructures*, 91, 128–135.
- Iqbal, Z., Maraj, E., Azhar, E., & Mehmood, Z. 2017. Framing the performance of induced magnetic field and entropy generation on cu and tio2 nanoparticles by using keller box scheme. *Advanced Powder Technology*, 28(9), 2332–2345.
- Isa, S., Arifin, N., Nazar, R., Bachok, N., Ali, F., & Pop, I. 2017. Mhd mixed convection boundary layer flow of a casson fluid bounded by permeable shrinking sheet with exponential variation. *Scientia Iranica*, 24(2), 637–647.
- Jafar, A. B., Shafie, S., & Ullah, I. 2020. Mhd radiative nanofluid flow induced by a nonlinear stretching sheet in a porous medium. *Heliyon*, 6(6), e04201.
- Jakeer, S., & Reddy, P. B. A. 2020. Entropy generation on emhd stagnation point flow of hybrid nanofluid over a stretching sheet: Homotopy perturbation solution. *Physica Scripta*, 95(12), 125203.
- Jamaludin, A., Naganthran, K., Nazar, R., & Pop, I. 2020. Mhd mixed convection stagnation-point flow of cu-al<sub>2</sub>o<sub>3</sub>/water hybrid nanofluid over a permeable stretching/shrinking surface with heat source/sink. *European Journal of Mechanics-B/Fluids*, 84, 71–80.
- Jamiatia, M. 2019. Numerical investigation in comparing the influence of water-silver-magnesium oxide hybrid nanofluid and water-silver normal nanofluid on fluid flow, heat transfer and entropy generation in an enclosure with rotating heat sources. *The European Physical Journal Plus*, 134(8), 1–15.
- Junoh, M. M., Ali, F. M., Arifin, N. M., Bachok, N., & Pop, I. 2019. Mhd stagnation-point flow and heat transfer past a stretching/shrinking sheet in a hybrid nanofluid with induced magnetic field. *International Journal of Numerical Methods for Heat & Fluid Flow*, 30(3), 1345–1364.
- Kameswaran, P., Narayana, M., Sibanda, P., & Murthy, P. 2012. Hydromagnetic nanofluid flow due to a stretching or shrinking sheet with viscous dissipation and chemical reaction effects. *International Journal of Heat and Mass Transfer*, 55(25-26), 7587–7595.
- Kármán, T. v. 1921. Über laminare und turbulente reibung. *ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik*, 1(4), 233–252.

## ***Bibliography***

---

- Khalid, A., Khan, I., Khan, A., Shafie, S., & Tlili, I. 2018. Case study of mhd blood flow in a porous medium with cnts and thermal analysis. *Case Studies in Thermal Engineering*, 12, 374–380.
- Khan, I., Malik, M., Hussain, A., & Khan, M. 2017. Magnetohydrodynamics carreau nanofluid flow over an inclined convective heated stretching cylinder with joule heating. *Results in Physics*, 7, 4001–4012.
- Khan, J., Mustafa, M., Hayat, T., & Alzahrani, F. 2017. Numerical study for bödewadt flow of water based nanofluid over a deformable disk: Buongiorno model. *Indian Journal of Physics*, 91(5), 527–533.
- Khan, M., Irfan, M., & Khan, W. 2019. Heat transfer enhancement for maxwell nanofluid flow subject to convective heat transport. *Pramana*, 92(2), 1–9.
- Khan, M. I., Hayat, T., Shah, F., & Haq, F. 2019. Physical aspects of cnts and induced magnetic flux in stagnation point flow with quartic chemical reaction. *International Journal of Heat and Mass Transfer*, 135, 561–568.
- Khan, S. A., Nie, Y., & Ali, B. 2020. Multiple slip effects on mhd unsteady viscoelastic nano-fluid flow over a permeable stretching sheet with radiation using the finite element method. *SN Applied Sciences*, 2(1), 1–14.
- Khan, U., Bilal, S., Zaib, A., Makinde, O., & Wakif, A. 2022. Numerical simulation of a nonlinear coupled differential system describing a convective flow of casson gold–blood nanofluid through a stretched rotating rigid disk in the presence of lorentz forces and nonlinear thermal radiation. *Numerical Methods for Partial Differential Equations*, 38(3), 308–328.
- Khan, U., Shafiq, A., Zaib, A., Sherif, E.-S. M., & Baleanu, D. 2020. Mhd radiative blood flow embracing gold particles via a slippery sheet through an erratic heat sink/source. *Mathematics*, 8(9), 1597.
- Khan, U., Zaib, A., Khan, I., & Nisar, K. S. 2021. Insight into the dynamics of transient blood conveying gold nanoparticles when entropy generation and lorentz force are significant. *International Communications in Heat and Mass Transfer*, 127, 105415.
- Khan, W., & Pop, I. 2010. Boundary-layer flow of a nanofluid past a stretching sheet. *International Journal of Heat and Mass Transfer*, 53(11-12), 2477–2483.
- Khanafer, K., Vafai, K., & Lightstone, M. 2003. Buoyancy-driven heat transfer enhancement in a two-dimensional enclosure utilizing nanofluids. *International*

- Journal of Heat and Mass Transfer*, 46(19), 3639–3653.
- Kierzenka, J., & Shampine, L. F. 2008. A bvp solver that controls residual and error. *JNAIAM J. Numer. Anal. Ind. Appl. Math*, 3(1-2), 27–41.
- Kiusalaas, J. 2005. *Numerical methods in engineering with matlab®*. Cambridge university press.
- Koriko, O., Omowaye, A., Animasaun, I. L., & Bamisaye, M. E. 2017. Melting heat transfer and induced-magnetic field effects on the micropolar fluid flow towards stagnation point: Boundary layer analysis. *International Journal of Engineering Research in Africa*, 29, 10–20.
- Koriko, O. K., Adegbe, K. S., Shah, N. A., Animasaun, I. L., & Olotu, M. A. 2021. Numerical solutions of the partial differential equations for investigating the significance of partial slip due to lateral velocity and viscous dissipation: the case of blood-gold carreau nanofluid and dusty fluid. *Numerical Methods for Partial Differential Equations*, 1–29.
- Koriko, O. K., Animasaun, I., Mahanthesh, B., Saleem, S., Sarojamma, G., & Sivaraj, R. 2018. Heat transfer in the flow of blood-gold carreau nanofluid induced by partial slip and buoyancy. *Heat Transfer—Asian Research*, 47(6), 806–823.
- Krishnamurthy, M., Gireesha, B., Prasannakumara, B., & Gorla, R. S. R. 2016. Thermal radiation and chemical reaction effects on boundary layer slip flow and melting heat transfer of nanofluid induced by a nonlinear stretching sheet. *Nonlinear Engineering*, 5(3), 147–159.
- Kumar, A., Tripathi, R., Singh, R., & Sheremet, M. A. 2021. Entropy generation on double diffusive mhd casson nanofluid flow with convective heat transfer and activation energy. *Indian Journal of Physics*, 95(7), 1423–1436.
- Kumar, M. A., Reddy, Y. D., Rao, V. S., & Goud, B. S. 2021. Thermal radiation impact on mhd heat transfer natural convective nano fluid flow over an impulsively started vertical plate. *Case Studies in Thermal Engineering*, 24, 100826.
- Kumar, R., Bhattacharyya, A., Seth, G., & Chamkha, A. J. 2021. Transportation of magnetite nanofluid flow and heat transfer over a rotating porous disk with arrhenius activation energy: Fourth order noumerov’s method. *Chinese Journal of Physics*, 69, 172–185.

## ***Bibliography***

---

- Kumar, R., Kumar, R., Sharma, T., & Sheikholeslami, M. 2021. Mathematical modeling of stagnation region nanofluid flow through darcy–forchheimer space taking into account inconsistent heat source/sink. *Journal of Applied Mathematics and Computing*, 65(1), 713–734.
- Kumar, R., Kumar, R., Shehzad, S. A., & Sheikholeslami, M. 2018. Rotating frame analysis of radiating and reacting ferro-nanofluid considering joule heating and viscous dissipation. *International Journal of Heat and Mass Transfer*, 120, 540–551.
- Kumar, R., Kumar, R., Sheikholeslami, M., & Chamkha, A. J. 2019. Irreversibility analysis of the three dimensional flow of carbon nanotubes due to nonlinear thermal radiation and quartic chemical reactions. *Journal of Molecular Liquids*, 274, 379–392.
- Kumar, R., Kumar, R., Vajravelu, K., & Sheikholeslami, M. 2020. Three dimensional stagnation flow of casson nanofluid through darcy-forchheimer space: a reduction to blasius/sakiadis flow. *Chinese Journal of Physics*, 68, 874–885.
- Kumari, M., Takhar, H. S., & Nath, G. 1990. Mhd flow and heat transfer over a stretching surface with prescribed wall temperature or heat flux. *Wärme-und Stoffübertragung*, 25(6), 331–336.
- Kundu, P. K., Cohen, I. M., & Dowling, D. R. 2015. *Fluid mechanics*. Academic press.
- Kuznetsov, A., & Avramenko, A. 2004. Effect of small particles on this stability of bioconvection in a suspension of gyrotactic microorganisms in a layer of finite depth. *International Communications in Heat and Mass Transfer*, 31(1), 1–10.
- Kuznetsov, A., & Nield, D. 2013. The cheng–minkowycz problem for natural convective boundary layer flow in a porous medium saturated by a nanofluid: a revised model. *International Journal of Heat and Mass Transfer*, 65, 682–685.
- Li, Y.-X., Rehman, M. I. U., Huang, W.-H., Khan, M. I., Khan, S. U., Chinram, R., & Kadry, S. 2022. Dynamics of casson nanoparticles with non-uniform heat source/sink: a numerical analysis. *Ain Shams Engineering Journal*, 13(1), 101496.
- Liu, Y., Jian, Y., & Tan, W. 2018. Entropy generation of electromagnetohydrodynamic (emhd) flow in a curved rectangular

- microchannel. *International Journal of Heat and Mass Transfer*, 127, 901–913.
- Łukasiewicz, K., & Fol, M. 2018. Microorganisms in the treatment of cancer: advantages and limitations. *Journal of Immunology Research*, 2018, 1–8.
- Lund, L. A., Omar, Z., Raza, J., & Khan, I. 2021. Magnetohydrodynamic flow of cu–fe<sub>3</sub>o<sub>4</sub>/h<sub>2</sub>o hybrid nanofluid with effect of viscous dissipation: dual similarity solutions. *Journal of Thermal Analysis and Calorimetry*, 143(2), 915–927.
- Mabood, F., Ashwinkumar, G., & Sandeep, N. 2022. Effect of nonlinear radiation on 3d unsteady mhd stagnancy flow of fe<sub>3</sub>o<sub>4</sub>/graphene–water hybrid nanofluid. *International Journal of Ambient Energy*, 43(1), 3385–3395.
- Mabood, F., Ibrahim, S., Kumar, P., & Lorenzini, G. 2020. Effects of slip and radiation on convective mhd casson nanofluid flow over a stretching sheet influenced by variable viscosity. *Journal of Engineering Thermophysics*, 29(2), 303–315.
- Mabood, F., Khan, W., & Ismail, A. M. 2015. Mhd boundary layer flow and heat transfer of nanofluids over a nonlinear stretching sheet: a numerical study. *Journal of Magnetism and Magnetic Materials*, 374, 569–576.
- Mabood, F., Yusuf, T., & Khan, W. 2021. Cu–al<sub>2</sub>o<sub>3</sub>–h<sub>2</sub>o hybrid nanofluid flow with melting heat transfer, irreversibility analysis and nonlinear thermal radiation. *Journal of Thermal Analysis and Calorimetry*, 143(2), 973–984.
- Mackolil, J., & Mahanthesh, B. 2019. Sensitivity analysis of radiative heat transfer in casson and nano fluids under diffusion-thermo and heat absorption effects. *The European Physical Journal Plus*, 134(12), 619.
- Mackolil, J., & Mahanthesh, B. 2021. Sensitivity analysis of marangoni convection in tio<sub>2</sub>–eg nanoliquid with nanoparticle aggregation and temperature-dependent surface tension. *Journal of Thermal Analysis and Calorimetry*, 143(3), 2085–2098.
- Madhu, M., Mahanthesh, B., Shashikumar, N., Shehzad, S., Khan, S., & Gireesha, B. 2020. Performance of second law in carreau fluid flow by an inclined microchannel with radiative heated convective condition. *International Communications in Heat and Mass Transfer*, 117, 104761.
- Mahanthesh, B., Animasaun, I., Rahimi-Gorji, M., & Alarifi, I. M. 2019. Quadratic convective transport of dusty casson and dusty carreau fluids past a stretched surface with nonlinear thermal radiation, convective condition and non-uniform

## ***Bibliography***

---

- heat source/sink. *Physica A: Statistical Mechanics and its Applications*, 535, 122471.
- Mahanthesh, B., Gireesha, B., Animasaun, I., Muhammad, T., & Shashikumar, N. 2019. Mhd flow of swent and mwent nanoliquids past a rotating stretchable disk with thermal and exponential space dependent heat source. *Physica Scripta*, 94(8), 085214.
- Mahanthesh, B., Gireesha, B. J., Gorla, R. S., & Makinde, O. D. 2018. Magnetohydrodynamic three-dimensional flow of nanofluids with slip and thermal radiation over a nonlinear stretching sheet: a numerical study. *Neural Computing and Applications*, 30(5), 1557–1567.
- Mahanthesh, B., Gireesha, B. J., PrasannaKumara, B. C., & Shashikumar, N. S. 2017. Marangoni convection radiative flow of dusty nanoliquid with exponential space dependent heat source. *Nuclear Engineering and Technology*, 49(8), 1660–1668.
- Mahanthesh, B., & Mackolil, J. 2021. Flow of nanoliquid past a vertical plate with novel quadratic thermal radiation and quadratic boussinesq approximation: sensitivity analysis. *International Communications in Heat and Mass Transfer*, 120, 105040.
- Mahanthesh, B., Mackolil, J., & Shehzad, S. A. 2020. Statistical analysis of stagnation-point heat flow in williamson fluid with viscous dissipation and exponential heat source effects. *Heat Transfer*, 49(8), 4580–4591.
- Mahanthesh, B., Thriveni, K., & Lorenzini, G. 2021. Significance of nonlinear boussinesq approximation and non-uniform heat source/sink on nanoliquid flow with convective heat condition: sensitivity analysis. *The European Physical Journal Plus*, 136(4), 1–18.
- Mahapatra, T., & Gupta, A. 2002. Heat transfer in stagnation-point flow towards a stretching sheet. *Heat and Mass transfer*, 38(6), 517–521.
- Manzoor, U., Muhammad, T., Farooq, U., & Waqas, H. 2022. Investigation of thermal stratification and nonlinear thermal radiation in darcy-forchheimer transport of hybrid nanofluid by rotating disk with marangoni convection. *International Journal of Ambient Energy*, 43(1), 1–8.
- Mathur, P., Jha, S., Ramteke, S., & Jain, N. 2018. Pharmaceutical aspects of silver nanoparticles. *Artificial Cells, Nanomedicine, and Biotechnology*, 46(sup1),



115–126.

- Maxwell, J. C. 1873. *A treatise on electricity and magnetism* (Vol. 1). Clarendon press.
- Md Basir, M. F., Kumar, R., Md Ismail, A. I., Sarojamma, G., Narayana, P. V. S., Raza, J., & Mahmood, A. 2019. Exploration of thermal-diffusion and diffusion-thermal effects on the motion of temperature-dependent viscous fluid conveying microorganism. *Arabian Journal for Science and Engineering*, *44*(9), 8023–8033.
- Mehmood, Z., & Iqbal, Z. 2016. Interaction of induced magnetic field and stagnation point flow on bioconvection nanofluid submerged in gyrotactic microorganisms. *Journal of Molecular Liquids*, *224*, 1083–1091.
- Minkowycz, W., Sparrow, E. M., & Abraham, J. P. 2012. *Nanoparticle heat transfer and fluid flow* (Vol. 4). CRC press.
- Montgomery, D. 2010. *Design and analysis of experiments, with design expert*. John Wiley 9. Course Policies.
- Muhammad, T., Alamri, S. Z., Waqas, H., Habib, D., & Ellahi, R. 2021. Bioconvection flow of magnetized carreau nanofluid under the influence of slip over a wedge with motile microorganisms. *Journal of Thermal Analysis and Calorimetry*, *143*(2), 945–957.
- Mukhopadhyay, S. 2013. Casson fluid flow and heat transfer over a nonlinearly stretching surface. *Chinese Physics B*, *22*(7), 074701.
- Mustafa, I., Javed, T., & Ghaffari, A. 2016. Heat transfer in mhd stagnation point flow of a ferrofluid over a stretchable rotating disk. *Journal of Molecular Liquids*, *219*, 526–532.
- Nadeem, S., Hayat, T., & Khan, A. U. 2019. Numerical study of 3d rotating hybrid swcnt–mwcnt flow over a convectively heated stretching surface with heat generation/absorption. *Physica Scripta*, *94*(7), 075202.
- Nakayama, Y. 2018. *Introduction to fluid mechanics*. Butterworth-Heinemann.
- Nandeppanavar, M. M., Vajravelu, K., Abel, M. S., & Siddalingappa, M. 2012. Second order slip flow and heat transfer over a stretching sheet with non-linear navier boundary condition. *International Journal of Thermal Sciences*, *58*, 143–150.
- Naramgari, S., & Sulochana, C. 2016. Dual solutions of radiative mhd nanofluid

## ***Bibliography***

---

- flow over an exponentially stretching sheet with heat generation/absorption. *Applied Nanoscience*, 6(1), 131–139.
- Nasir, S., Islam, S., Gul, T., Shah, Z., Khan, M. A., Khan, W., . . . Khan, S. 2018. Three-dimensional rotating flow of mhd single wall carbon nanotubes over a stretching sheet in presence of thermal radiation. *Applied Nanoscience*, 8(6), 1361–1378.
- Nazeer, M., Irfan, M., Hussain, F., & Siddique, I. 2022. Entropy generation analysis in blood-gold casson nanofluid through horizontal wavy channel with velocity and thermal slips: Applications in skin diseases. *Journal of Computational Biophysics and Chemistry*, 1–14.
- Obalalu, A. M. 2022. Chemical entropy generation and second-order slip condition on hydrodynamic casson nanofluid flow embedded in a porous medium: a fast convergent method. *Journal of the Egyptian Mathematical Society*, 30(1), 1–25.
- Oke, A., Animasaun, I., Mutuku, W., Kimathi, M., Shah, N. A., & Saleem, S. 2021. Significance of coriolis force, volume fraction, and heat source/sink on the dynamics of water conveying 47 nm alumina nanoparticles over a uniform surface. *Chinese Journal of Physics*, 71, 716–727.
- Pal, D., & Mondal, S. K. 2018. Mhd nanofluid bioconvection over an exponentially stretching sheet in the presence of gyrotactic microorganisms and thermal radiation. *BioNanoScience*, 8(1), 272–287.
- Platt, J. R. 1961. " bioconvection patterns" in cultures of free-swimming organisms. *Science*, 133(3466), 1766–1767.
- Pordanjani, A. H., Vahedi, S. M., Aghakhani, S., Afrand, M., Öztop, H. F., & Abu-Hamdeh, N. 2019. Effect of magnetic field on mixed convection and entropy generation of hybrid nanofluid in an inclined enclosure: sensitivity analysis and optimization. *The European Physical Journal Plus*, 134(8), 1–20.
- Puneeth, V., Manjunatha, S., Madhukesh, J., & Ramesh, G. 2021. Three dimensional mixed convection flow of hybrid casson nanofluid past a non-linear stretching surface: A modified buongiorno's model aspects. *Chaos, Solitons & Fractals*, 152, 111428.
- Ramesh, G., Shehzad, S., & Izadi, M. 2020. Thermal transport of hybrid liquid over thin needle with heat sink/source and darcy–forchheimer porous medium

- aspects. *Arabian Journal for Science and Engineering*, 45(11), 9569–9578.
- Ramesh, G., Shehzad, S., & Tlili, I. 2020. Hybrid nanomaterial flow and heat transport in a stretchable convergent/divergent channel: a darcy-forchheimer model. *Applied Mathematics and Mechanics*, 41(5), 699–710.
- Ramly, N., Sivasankaran, S., & Noor, N. 2017. Zero and nonzero normal fluxes of thermal radiative boundary layer flow of nanofluid over a radially stretched surface. *Scientia Iranica*, 24(6), 2895–2903.
- Ramzan, M., Riasat, S., Shah, Z., Kumam, P., & Thounthong, P. 2020. Unsteady mhd carbon nanotubes suspended nanofluid flow with thermal stratification and nonlinear thermal radiation. *Alexandria Engineering Journal*, 59(3), 1557–1566.
- Rana, P., & Bhargava, R. 2012. Flow and heat transfer of a nanofluid over a nonlinearly stretching sheet: a numerical study. *Communications in Nonlinear Science and Numerical Simulation*, 17(1), 212–226.
- Rana, P., Mahanthesh, B., Mackolil, J., & Al-Kouz, W. 2021. Nanofluid flow past a vertical plate with nanoparticle aggregation kinematics, thermal slip and significant buoyancy force effects using modified buongiorno model. *Waves in Random and Complex Media*, 1–25.
- Rana, P., Shukla, N., Bég, O. A., & Bhardwaj, A. 2021. Lie group analysis of nanofluid slip flow with stefan blowing effect via modified buongiorno's model: entropy generation analysis. *Differential Equations and Dynamical Systems*, 29(1), 193–210.
- Raval, J. P., Joshi, P., & Chejara, D. R. 2018. Carbon nanotube for targeted drug delivery. In *Applications of nanocomposite materials in drug delivery* (pp. 203–216). Elsevier.
- Raza, J., Farooq, M., Mebarek-Oudina, F., & Mahanthesh, B. 2019. Multiple slip effects on mhd non-newtonian nanofluid flow over a nonlinear permeable elongated sheet: numerical and statistical analysis. *Multidiscipline Modeling in Materials and Structures*, 15(5), 913–931.
- Raza, M., Ellahi, R., Sait, S. M., Sarafraz, M., Shadloo, M. S., & Waheed, I. 2020. Enhancement of heat transfer in peristaltic flow in a permeable channel under induced magnetic field using different cnts. *Journal of Thermal Analysis and Calorimetry*, 140(3), 1277–1291.

## ***Bibliography***

---

- Rout, H., Mohapatra, S., Shaw, S., Muhammad, T., Nayak, M., & Makinde, O. D. 2021. Entropy optimization for darcy–forchheimer electro-magneto-hydrodynamic slip flow of ferronano fluid due to stretching/shrinking rotating disk. *Waves in Random and Complex Media*, 1–33.
- Sadiq, M. A., Haider, F., Hayat, T., & Alsaedi, A. 2020. Partial slip in darcy-forchheimer carbon nanotubes flow by rotating disk. *International Communications in Heat and Mass Transfer*, 116, 104641.
- Salahuddin, T. 2020. Carreau fluid model towards a stretching cylinder: Using keller box and shooting method. *Ain Shams Engineering Journal*, 11(2), 495–500.
- Salahuddin, T., Hussain, A., Malik, M., Awais, M., & Khan, M. 2017. Carreau nanofluid impinging over a stretching cylinder with generalized slip effects: using finite difference scheme. *Results in Physics*, 7, 3090–3099.
- Sampath Kumar, P., Gireesha, B., Mahanthesh, B., & Chamkha, A. J. 2019. Thermal analysis of nanofluid flow containing gyrotactic microorganisms in bioconvection and second-order slip with convective condition. *Journal of Thermal Analysis and Calorimetry*, 136(5), 1947–1957.
- Sandeep, N., Chamkha, A. J., & Animasaun, I. 2017. Numerical exploration of magnetohydrodynamic nanofluid flow suspended with magnetite nanoparticles. *Journal of the Brazilian Society of Mechanical Sciences and Engineering*, 39(9), 3635–3644.
- Sarkar, G., & Sahoo, B. 2021. On dual solutions of the unsteady mhd flow on a stretchable rotating disk with heat transfer and a linear temporal stability analysis. *European Journal of Mechanics-B/Fluids*, 85, 149–157.
- Schlichting, H., & Kestin, J. 1961. *Boundary layer theory* (Vol. 121). Springer.
- Sembulingam, K., & Sembulingam, P. 2012. *Essentials of medical physiology*. JP Medical Ltd.
- Senapati, M., Parida, S. K., Swain, K., & Ibrahim, S. M. 2022. Analysis of variable magnetic field on chemically dissipative mhd boundary layer flow of casson fluid over a nonlinearly stretching sheet with slip conditions. *International Journal of Ambient Energy*, 43(1), 3712–3726.
- Seth, G., Bhattacharyya, A., Kumar, R., & Chamkha, A. 2018. Entropy generation in hydromagnetic nanofluid flow over a non-linear stretching sheet with navier’s

- velocity slip and convective heat transfer. *Physics of Fluids*, 30(12), 122003.
- Shafiq, A., Sindhu, T. N., & Khalique, C. M. 2020. Numerical investigation and sensitivity analysis on bioconvective tangent hyperbolic nanofluid flow towards stretching surface by response surface methodology. *Alexandria Engineering Journal*, 59(6), 4533–4548.
- Shah, N. A., Animasaun, I., Chung, J. D., Wakif, A., Alao, F., & Raju, C. 2021. Significance of nanoparticle's radius, heat flux due to concentration gradient, and mass flux due to temperature gradient: The case of water conveying copper nanoparticles. *Scientific Reports*, 11(1), 1–11.
- Shah, Z., Bonyah, E., Islam, S., & Gul, T. 2019. Impact of thermal radiation on electrical mhd rotating flow of carbon nanotubes over a stretching sheet. *AIP Advances*, 9(1), 015115.
- Shahid, A., Huang, H., Bhatti, M. M., Zhang, L., & Ellahi, R. 2020. Numerical investigation on the swimming of gyrotactic microorganisms in nanofluids through porous medium over a stretched surface. *Mathematics*, 8(3), 380.
- Shampine, L. F., & Reichelt, M. W. 1997. The matlab ode suite. *SIAM Journal on Scientific Computing*, 18(1), 1–22.
- Shehzad, S., Mabood, F., Rauf, A., Izadi, M., & Abbasi, F. 2021. Rheological features of non-newtonian nanofluids flows induced by stretchable rotating disk. *Physica Scripta*, 96(3), 035210.
- Sheikholeslami, M., & Ganji, D. 2013. Heat transfer of cu-water nanofluid flow between parallel plates. *Powder Technology*, 235, 873–879.
- Sheikholeslami, M., Ganji, D., & Rashidi, M. 2016. Magnetic field effect on unsteady nanofluid flow and heat transfer using buongiorno model. *Journal of Magnetism and Magnetic Materials*, 416, 164–173.
- Sindhu, S., & Gireesha, B. J. 2021. Effect of nanoparticle shapes on irreversibility analysis of nanofluid in a microchannel with individual effects of radiative heat flux, velocity slip and convective heating. *Heat Transfer*, 50(1), 876–892.
- Sk, M. T., Das, K., & Kundu, P. K. 2016. Effect of magnetic field on slip flow of nanofluid induced by a non-linear permeable stretching surface. *Applied Thermal Engineering*, 104, 758–766.
- Song, Y.-Q., Obideyi, B., Shah, N. A., Animasaun, I., Mahrous, Y., & Chung, J. D. 2021. Significance of haphazard motion and thermal migration of alumina

## ***Bibliography***

---

- and copper nanoparticles across the dynamics of water and ethylene glycol on a convectively heated surface. *Case Studies in Thermal Engineering*, 26, 101050.
- Spalding, D. B. 1954. Mass transfer in laminar flow. *Proceedings of the Royal Society of London. Series A. Mathematical and Physical Sciences*, 221(1144), 78–99.
- Sravanthi, C. 2019. Effect of nonlinear thermal radiation on silver and copper water nanofluid flow due to a rotating disk with variable thickness in the presence of nonuniform heat source/sink using the homotopy analysis method. *Heat Transfer—Asian Research*, 48(8), 4033–4048.
- Sreedevi, P., & Reddy, P. S. 2019. Effect of swcnts and mwcnts maxwell mhd nanofluid flow between two stretchable rotating disks under convective boundary conditions. *Heat Transfer—Asian Research*, 48(8), 4105–4132.
- Strauss, W. A. 2007. *Partial differential equations: An introduction*. John Wiley & Sons.
- Subhani, M., & Nadeem, S. 2019. Numerical analysis of micropolar hybrid nanofluid. *Applied Nanoscience*, 9(4), 447–459.
- Subramanian, K., Rao, T. N., & Balakrishnan, A. 2019. *Nanofluids and their engineering applications*. CRC Press.
- Sun, X., Animasaun, I. L., Swain, K., Shah, N. A., Wakif, A., & Olanrewaju, P. O. 2022. Significance of nanoparticle radius, inter-particle spacing, inclined magnetic field, and space-dependent internal heating: The case of chemically reactive water conveying copper nanoparticles. *ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik*, 102(4), e202100094.
- Suresh Reddy, E., & Panda, S. 2022. Heat transfer of mhd natural convection casson nanofluid flows in a wavy trapezoidal enclosure. *The European Physical Journal Special Topics*, 231(13-14), 2733–2747.
- Thriveni, K., & Mahanthesh, B. 2021. Significance of variable fluid properties on hybrid nanoliquid flow in a micro-annulus with quadratic convection and quadratic thermal radiation: response surface methodology. *International Communications in Heat and Mass Transfer*, 124, 105264.
- Thumma, T., & Mishra, S. 2020. Effect of nonuniform heat source/sink, and viscous and joule dissipation on 3d eyring–powell nanofluid flow over a stretching sheet.

- Journal of Computational Design and Engineering*, 7(4), 412–426.
- Timofeeva, E. V., Routbort, J. L., & Singh, D. 2009. Particle shape effects on thermophysical properties of alumina nanofluids. *Journal of Applied Physics*, 106(1), 014304.
- Tiwari, R. K., & Das, M. K. 2007. Heat transfer augmentation in a two-sided lid-driven differentially heated square cavity utilizing nanofluids. *International Journal of Heat and Mass transfer*, 50(9-10), 2002–2018.
- Tlili, I., Ramzan, M., Nisa, H. U., Shutaywi, M., Shah, Z., & Kumam, P. 2020. Onset of gyrotactic microorganisms in mhd micropolar nanofluid flow with partial slip and double stratification. *Journal of King Saud University-Science*, 32(6), 2741–2751.
- Tripathi, D., Prakash, J., Tiwari, A. K., & Ellahi, R. 2020. Thermal, microrotation, electromagnetic field and nanoparticle shape effects on cu-cuo/blood flow in microvascular vessels. *Microvascular Research*, 132, 104065.
- Truong, N. P., Whittaker, M. R., Mak, C. W., & Davis, T. P. 2015. The importance of nanoparticle shape in cancer drug delivery. *Expert Opinion on Drug Delivery*, 12(1), 129–142.
- Turkyilmazoglu, M. 2012. Three dimensional mhd stagnation flow due to a stretchable rotating disk. *International Journal of Heat and Mass Transfer*, 55(23-24), 6959–6965.
- Turkyilmazoglu, M. 2014. Nanofluid flow and heat transfer due to a rotating disk. *Computers & Fluids*, 94, 139–146.
- Uddin, I., Khan, M. A., Ullah, S., Islam, S., Israr, M., & Hussain, F. 2018. Characteristics of buoyancy force on stagnation point flow with magneto-nanoparticles and zero mass flux condition. *Results in Physics*, 8, 160–168.
- Uddin, M., Khan, W., Qureshi, S., & Bég, O. A. 2017. Bioconvection nanofluid slip flow past a wavy surface with applications in nano-biofuel cells. *Chinese Journal of Physics*, 55(5), 2048–2063.
- Upadhyaya, S. M., Devi, R., Raju, C., & Ali, H. M. 2021. Magnetohydrodynamic nonlinear thermal convection nanofluid flow over a radiated porous rotating disk with internal heating. *Journal of Thermal Analysis and Calorimetry*, 143(3), 1973–1984.

## ***Bibliography***

---

- ur Rehman, S., Mir, N. A., Farooq, M., Rizwan, M., Ahmad, F., Ahmad, S., & Ahmad, B. 2020. Analysis of thermally stratified flow of sutterby nanofluid with zero mass flux condition. *Journal of Materials Research and Technology*, *9*(2), 1631–1639.
- Usman, M., Soomro, F. A., Haq, R. U., Wang, W., & Defterli, O. 2018. Thermal and velocity slip effects on casson nanofluid flow over an inclined permeable stretching cylinder via collocation method. *International Journal of Heat and Mass Transfer*, *122*, 1255–1263.
- Vahedi, S. M., Pordanjani, A. H., Raisi, A., & Chamkha, A. J. 2019. Sensitivity analysis and optimization of mhd forced convection of a cu-water nanofluid flow past a wedge. *The European Physical Journal Plus*, *134*(3), 1–21.
- Verma, A. K., Rajput, S., Bhattacharyya, K., & Chamkha, A. J. 2022. Nanoparticle's radius effect on unsteady mixed convective copper-water nanofluid flow over an expanding sheet in porous medium with boundary slip. *Chemical Engineering Journal Advances*, *12*, 100366.
- Vinita, V., & Poply, V. 2020. Impact of outer velocity mhd slip flow and heat transfer of nanofluid past a stretching cylinder. *Materials Today: Proceedings*, *26*, 3429–3435.
- Wager, H. W. T. 1911. Vii. on the effect of gravity upon the movements and aggregation of euglena viridis, ehrb., and other micro-organisms. *Philosophical Transactions of the Royal Society of London. Series B, Containing Papers of a Biological Character*, *201*(274-281), 333–390.
- Waini, I., Ishak, A., & Pop, I. 2019a. Hybrid nanofluid flow and heat transfer over a nonlinear permeable stretching/shrinking surface. *International Journal of Numerical Methods for Heat & Fluid Flow*, *29*(9), 3110–3127.
- Waini, I., Ishak, A., & Pop, I. 2019b. Unsteady flow and heat transfer past a stretching/shrinking sheet in a hybrid nanofluid. *International Journal of Heat and Mass Transfer*, *136*, 288–297.
- Waini, I., Ishak, A., & Pop, I. 2021. Unsteady hybrid nanofluid flow on a stagnation point of a permeable rigid surface. *ZAMM-Journal of Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik*, *101*(6), e202000193.
- Wang, C. 1989. Free convection on a vertical stretching surface. *ZAMM-Journal of*



- Applied Mathematics and Mechanics/Zeitschrift für Angewandte Mathematik und Mechanik*, 69(11), 418–420.
- Waqas, H., Naseem, R., Muhammad, T., & Farooq, U. 2021. Bioconvection flow of casson nanofluid by rotating disk with motile microorganisms. *Journal of Materials Research and Technology*, 13, 2392–2407.
- Wazwaz, A.-M. 2002. *Partial differential equations*. CRC Press.
- Wu, L. 2008. A slip model for rarefied gas flows at arbitrary knudsen number. *Applied Physics Letters*, 93(25), 253103.
- Xue, Q. 2005. Model for thermal conductivity of carbon nanotube-based composites. *Physica B: Condensed Matter*, 368(1-4), 302–307.
- Yang, C., Li, W., & Nakayama, A. 2013. Convective heat transfer of nanofluids in a concentric annulus. *International Journal of Thermal Sciences*, 71, 249–257.
- Yusuf, T., Mabood, F., Khan, W., & Gbadeyan, J. 2020. Irreversibility analysis of cu-tio<sub>2</sub>-h<sub>2</sub>o hybrid-nanofluid impinging on a 3-d stretching sheet in a porous medium with nonlinear radiation: Darcy-forchheimer's model. *Alexandria Engineering Journal*, 59(6), 5247–5261.
- Zainal, N. A., Nazar, R., Naganthran, K., & Pop, I. 2021. Unsteady emhd stagnation point flow over a stretching/shrinking sheet in a hybrid al<sub>2</sub>o<sub>3</sub>-cu/h<sub>2</sub>o nanofluid. *International Communications in Heat and Mass Transfer*, 123, 105205.
- Zhang, L. 2021. Application of fractal theory in transient pressure properties of hydrocarbon reservoir. In *Modelling of flow and transport in fractal porous media* (pp. 193–249). Elsevier.
- Zhang, L., Bhatti, M. M., & Michaelides, E. E. 2020. Electro-magnetohydrodynamic flow and heat transfer of a third-grade fluid using a darcy-brinkman-forchheimer model. *International Journal of Numerical Methods for Heat & Fluid Flow*, 31(8), 2623–2639.
- Zhou, J.-C., Abidi, A., Shi, Q.-H., Khan, M. R., Rehman, A., Issakhov, A., & Galal, A. M. 2021. Unsteady radiative slip flow of mhd casson fluid over a permeable stretched surface subject to a non-uniform heat source. *Case Studies in Thermal Engineering*, 26, 101141.